United States
Department of
Agriculture

Economic
Research
Service

Agriculture
and Trade
Analysis
Division

Structural Adjustment and Nigerian Agriculture

An Initial Assessment

Aloysius C. Nwosu

Structural Adjustment and Nigerian Agriculture: An Initial Assessment.
By Aloysius C. Nwosu. Agriculture and Trade Analysis Division, Economic Research Service, U.S. Department of Agriculture. Staff Report No. AGES 9224.

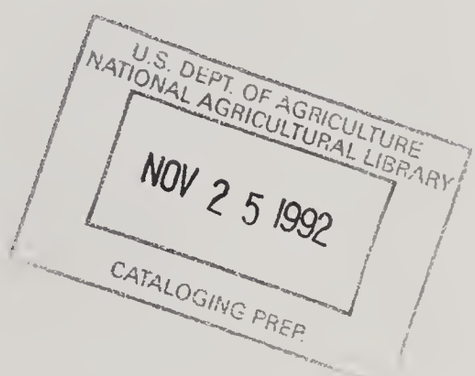
Abstract

Nigeria's structural adjustment program (SAP) appears, on balance, to have favorably affected Nigerian agricultural production, prices, employment, and agriculture's contributions to gross domestic product and foreign exchange earnings. However, the negative effects on food consumption, trade, and socioeconomic factors have tended to undermine gains from SAP. Some of these effects are partly attributable to the ban on certain food imports that, although not formally part of SAP, have continued in effect after SAP ended in 1988. Removal of such trade barriers would result in a rapid rise of U.S. exports to Nigeria.

Keywords: Structural adjustment, domestic policies, agriculture, Nigeria, investment, production, prices, consumption, socioeconomic effects

Acknowledgments

The author particularly wants to thank Gene Mathia for initiating this project, for words of encouragement, and valuable comments and suggestions on the manuscript. The author is also indebted to Lon Cesal, Michael Kurtzig, Rebecca Lent, and Carl Mabbs-Zeno for constructive comments and suggestions, to Arthur Dommen and Shahla Shapouri for careful editing, and to Margaret Missiaen and Mark Wenner for encouragement. Thanks to Shade Sangosina, Linda Scott, and Pam Weaver for reformatting and finalizing the tables.



Washington, DC 20005-4788 September 1992

Contents

Page

Foreword

The Africa and Middle East Branch of the Economic Research Service has compiled a long record of research on the agricultural production and trade of the countries of Sub-Saharan Africa. None of these countries (with the possible exception of the Republic of South Africa) is potentially more important to U.S. agricultural interests than Nigeria, a country with which the United States has maintained a friendly and mutually beneficial relationship since it became independent in 1960. Not only is Nigeria Africa's most populous country, it is also an important oil exporter on world markets. This has been both a blessing and a bane, because since the mid-1960's the boom enjoyed by Nigeria's oil industry caused considerable damage to the viability of the country's agricultural economy, as is now documented by impartial research conducted both in Nigeria and abroad.

ERS researchers have taken part in assessment missions in Nigeria at the request of the federal Nigerian Government and international organizations. In this report, Aloysius C. Nwosu, an assistant research director at the Nigerian Institute of Social and Economic Research (NISER) at Ibadan, who was a visiting scholar in ERS in 1991 under the Fulbright Fellowship Program, examines the steps the Nigerian Government has taken to redress the situation and attempts a preliminary evaluation of the effect the structural adjustment program has had on Nigeria's agricultural sector. While some of the measures instituted, such as the ban on imports of grains and oilseeds, have undoubtedly hurt U.S. agricultural exports in the short term, the aim of the program was to put the Nigerian economy on a firm footing once again, and if successful it would lead to an expansion of agricultural trade in the longer term. Changes in such bilateral trade might involve such items as feed grains and feed components for a developing livestock sector, high-value agricultural commodities, and inputs such as farm machinery and infrastructural equipment. Readers should note that Nwosu's report contains no official USDA data.

As Nwosu's analysis makes clear, there are reasons for believing, in spite of data shortcomings, that the structural adjustment program yielded benefits to Nigeria's majority rural population, although serious problems remain. One of these is the compression of demand for food in both the rural and urban sectors that has occurred as a consequence of macroeconomic changes instituted by the government.

Gene A. Mathia, Chief
Africa and Middle East Branch
Agriculture and Trade Analysis Division
Economic Research Service

Summary

At the end of the 1970's, mismanagement of Nigeria's resources, particularly earnings from oil exports, coupled with poor economic policies, had created a serious imbalance between aggregate demand and aggregate supply, distortion of relative prices, and erosion of international competitiveness. Rising aggregate demand, supported for a long time through access to external financing, had led to growing current account deficits, worsening external payments, and an increasing external debt burden. A serious economic crisis erupted when access to external financing became constrained.

Nigeria's agricultural sector was severely affected by this economic crisis. Domestically produced food and agricultural products were placed at a serious marketing disadvantage, compared with imports of these same items as a result of an overvalued currency, which reduced incentives to producers. Production and exports of the country's major agricultural trade goods fell drastically. Reforms were urgently needed because of the importance of the country's agricultural sector in the overall economy.

The reforms were combined into the structural adjustment program (SAP), which went into effect in 1986. Policymakers anticipated that new macroeconomic policies and the special provisions for the agricultural sector under SAP would achieve the following:

- Rapidly increased food production, thereby reducing food imports.
- Increased sourcing of industrial raw materials from domestic output, thereby reducing import dependence.
- Increased output of traditional export crops (cocoa, palm produce, rubber, and cotton), thereby diversifying the export base and enhancing foreign exchange earning capacity to reduce the overbearing dependence on oil exports.
- Maximal growth of value added and generation of employment in the industrial sector, which would be enhanced by increased output and domestic processing of agricultural raw materials.
- Increased rural employment, incomes, and welfare stemming from the boom in agricultural production and rising agricultural prices.
- Beyond these goals specific to agriculture, the SAP program aimed to increase the agricultural sector's contribution to GDP and reduce public sector ownership and control over enterprises.

The federal Nigerian Ministry of Agriculture and its counterparts in each state were assigned large roles in the implementation of SAP. However, other institutions were also important. These may be categorized into three groups: financial, agricultural, and others. Financial institutions comprised the Central Bank of Nigeria (CBN), the commercial and merchant banks, and the Nigerian Agricultural and Cooperative Bank (NACB). Agricultural institutions comprised Agricultural Development Projects (ADP's), River Basin Development Authorities (RBDA's), and the Directorate of Food, Roads, and Rural Infrastructure (DFRRI). Other institutions included the National Directorate of Employment and the Technical Committee on Privatization and Commercialization.

SAP had a significant effect on agricultural prices, production, employment, and agricultural trade. The data for a comprehensive analysis of the performance of the various sectors of the economy are not available. The broad objective of this analysis is to compare the initial results in the agricultural sector with the pre-SAP situation, thereby forming some idea of the changes induced by SAP. It should be emphasized that it could take 10-15 years before the full effects of SAP are realized. Thus, the results of this analysis can be regarded as only tentative.

Real producer prices and real retail prices of staple foods initially fell, but then rose, following the inception of SAP in 1986. Real producer prices of all cash crops (except rubber) received a significant boost. The ratio of real producer price to world price declined for nontraded food crops but increased for traded cash crops (except palm oil and rubber) during the SAP period.

Some of the SAP-related factors that contributed to rapid rises in food and agricultural prices were the reduction in the fuel subsidy, rising transportation costs, rising demand for agricultural products by industries that had previously depended on imports, and the trade of foodstuffs with neighboring countries in the quest for foreign exchange. However, the devaluation of the naira was a major force behind the rise of domestic prices of export crops, which kept rising even when international prices were falling. The ban on imports of major staples (maize, rice, and wheat) was another important factor that limited sources of supply for agro-based industries and increased demand for domestically produced staple foods.

Aggregate agricultural output responded to rising prices as expected. The average index of agricultural production during the SAP period (1987-89) was almost 6 percent higher than that of the pre-SAP period (1984-86). The average an-

nual contribution of agriculture to gross domestic product (GDP) grew in both absolute and relative terms. The contribution of agriculture to foreign exchange earnings increased from an average of 3.2 percent in the pre-SAP period to 7.3 percent in the SAP period. All subsectors of agriculture (except livestock) grew in absolute terms.

Not all crops benefited equally from SAP policies, however. The average annual output of sorghum, cassava, rubber, and palm kernels in 1987-89 was less than the 1984-86 pre-SAP average. The aggregate output of staples was higher in 1987-89 than in 1984-86 due to the higher output of roots and tubers.

Supply and utilization of agricultural inputs showed a mixed picture as a result of SAP. Some data show domestic output and net domestic supply of fertilizers as well as the number of tractors having increased significantly. Increasing financial investment improved the provision of rural and agricultural facilities, mainly to the ADPs. The evidence is not clear whether smallholders are using more of the improved inputs since inception of SAP.

Crop prices rose more than input costs, and crop production remained profitable during SAP. The return per hectare was about 102 percent higher in the SAP period than in the pre-SAP period. The rate of return was, however, much lower than this (about 22 percent) when inflation was taken into account. A producer subsidy equivalent (PSE) analysis shows that a tax of 113.7 million naira annually imposed on producers of selected crops by the government before SAP turned into a subsidy during the SAP period of 180.3 million naira. The only major commodity that continued to be taxed after SAP was cocoa, and that tax decreased. The policy measure that imposed the highest tax on crop production in the pre-SAP period was exchange rate overvaluation. The fact that some tax on crop production still derives from this source indicates that the exchange rate is still somewhat overvalued.

Per capita consumption of cereals, pulses, and fruits rose, but that of roots, tubers, and sugar declined. Increased consumption of cereals, despite a fall in domestic output and a ban on imports, probably reflects unofficial (smuggled) imports, especially of wheat and wheat products. Nigerians, however, appeared to be less well fed in the SAP period, as the average per capita caloric intake of starches, proteins, and fat fell.

The overall policy transfer to consumers of selected crops changed from a pre-SAP subsidy of 115.7 million naira to a tax of 435 million naira during SAP, thus indicating that SAP policies imposed a significant financial burden on consumers. While pre-SAP nontariff border controls imposed the heaviest tax on consumers, post-SAP tariffs imposed the heaviest burden on consumers. Overvaluation of the naira provided the highest subsidy to consumers before SAP, and has continued to subsidize consumers in the SAP period, although at a much lower level.

Some of the policies instituted ran counter to the pattern of reduced government intervention sought by SAP. These included bans on trade in certain commodities, the retention of some subsidy on fertilizers, and a plan to create farm complexes in each of the 21 Nigerian states as a way of tackling unemployment.

While the evidence suggests that SAP was beneficial to the farm sector (especially to smallholders), a final evaluation of its multiple and dynamic effects on prices, incomes, and employment is not yet possible. Additional research oriented to rural household expenditure and consumption patterns, and trade effects of further trade and monetary reforms, will be required for this purpose.

Structural Adjustment and Nigeria's Agriculture

An Initial Assessment

Aloysius C. Nwosu

Introduction

Analysts have blamed the economic crisis in Nigeria during the early 1980's on two major factors: first, the mismanagement of resources, and second, the instability in the world oil market. Reference is often made to the "squandermania" that characterized the oil boom period of the 1970's, which was marked by gigantic "white elephant" projects and national and international jamborees with questionable contributions to economic development. The period also saw large-scale corruption and fraud. The many cases of corrupt enrichment have been the subject of various tribunals since the early 1980's (*12*, *17*, *22*).

The mismanagement of resources, coupled with poor economic policies, may have created a serious imbalance between aggregate demand and aggregate supply, the distortion of relative prices, and the erosion of international competitiveness. Rising aggregate demand, historically supported through access to external financing, led to growing current accounts deficits, worsening external payments, and an increasing external debt burden (*14*). The economic crisis appears to have erupted when access to external financing became constrained.

The second key factor in the economic crisis was the instability of the world oil market. Two issues are crucial to understanding how the instability in the world oil market became easily transmitted to the Nigerian economy. The first, and probably the more important, is the dominant role of oil as the foreign exchange earner. Nigeria derived about 94 percent of its foreign exchange from oil exports by 1980 (table 1). The rapid drop in oil production from 2.1 million barrels per day (bpd) in January 1981 to only 640,000 bpd in August 1981 (*12*) caused a drastic fall in oil export revenues and sent shock waves through a heavily import-dependent economy. Nigeria's foreign exchange earnings had declined to about $6.8 billion by 1986, when the structural adjustment program (SAP) began, a 74-percent drop from $26.3 billion in 1980 (table 1). Foreign exchange reserves which stood at $10.2 billion in 1980 fell to $3.9 billion in 1981, and to a mere $1.1 billion in 1986. The debt burden rose simultaneously from $8.9 billion in 1980 to $26.9 billion by 1986, an increase of 124 percent.

The second issue is that while Nigeria's foreign exchange earnings rose and fell with the price of oil, its dependence on imports, not only of consumer goods but also of capital goods essential for the manufacturing sector and some major staples such as maize and rice which Nigeria also produces, remained high. Nigeria's self-sufficiency ratio in maize and rice declined and imports of the two commodities rose rapidly between 1970 and 1982 (table 2). Some economic measures were introduced after 1982 to restrict the inflow of these commodities in order to conserve foreign exchange and to protect domestic producers. But these measures proved inadequate, and Nigeria's agricultural sector suffered heavily from the inflow of oil money in what has been called the "Dutch disease" (*17*, *18*).

Nigerians had developed a considerable taste for a range of imported livestock and crop products. Wheat, consumed largely as bread, was prominent among these products. Wheat imports rose from 271,000 metric tons in 1970 to 1.5 million metric tons by 1982 (table 2). The cost of wheat imports increased from $22 million to $330 million during the same period. The cost had reached $368 million by 1985, and, in 1986, wheat imports were banned.

The Nigerian economy had become so import-dependent by 1986 that any cut in imports was immediately manifested in acute shortages of basic consumer items (detergents, cooking oil, kerosene, and other items) and rising unemployment, as well as capacity underutilization in the import-dependent manufacturing industries. Some food items became scarce, and their prices rose. Other manifestations included massive worker layoffs in manufacturing industries, an acute shortage of foreign exchange for external transactions, and increasing difficulty in meeting financial obligations both at home and abroad. The government resorted to mass retrenchment and

Aloysius C. Nwosu is an assistant research director at the Nigerian Institute of Social and Economic Research (NISER), Ibadan. This report was prepared in 1991 while he was visiting Fulbright Scholar in the Agriculture and Trade Analysis Division, Economic Research Service, U.S. Department of Agriculture.

retirement of workers in an effort to reduce its wage bill. There was an atmosphere of widespread hardship and uncertainty.

The first government response to the economic crisis was the enactment of the Economic Stabilization Act (ESA) of 1982, which imposed stringent exchange and import controls and restrictive monetary and fiscal policies. The act's prime objective was to drastically curtail imports and capital expenditures. The economy did not improve, and by October 1985 the government declared a 15-month emergency period during which compulsory deductions were made from workers' salaries and company profits in order to meet budgetary deficits.

The downward slide of the economy continued despite the ESA. The reinforcement of the ESA culminated in the structural adjustment program (SAP), which was implemented from July 1986 to June 1988. SAP has officially ended but its policies are still in force.

The data for a comprehensive analysis of the performance of the various sectors of the economy are not yet available. The broad objective of the analysis here is to compare the initial results in the agricultural sector with the pre-SAP situation, thereby forming some idea of the changes induced by SAP. However, it could take 10-15 years before the full effects of SAP are realized. Thus, the results of this analysis can be regarded as only tentative.

The choice of agriculture for initial assessment is influenced largely by two factors. First, a vast proportion of Nigerians derive their livelihood from agriculture as farmers and as marketers, distributors, and processors of farm products. Second, agriculture was considered by policymakers to be the sector where improvements could quickly cause changes in the economy. This probably explains why the government recently decided to develop farm complexes to generate employment.

SAP Objectives and Policy Measures

The broad objective of SAP was to change the pattern of aggregate domestic expenditure and production, to achieve a higher level of food self-sufficiency, and to broaden the export base by enhancing non-oil exports. The specific objectives were (*6*, *14*):

- To diversify the productive base of the economy in order to reduce dependence on the oil sector and on imports.
- To achieve fiscal balance.
- To control inflation and lay a basis for sustainable growth
- To reduce public sector participation in direct production, make the public sector more efficient, and expand the role of the private sector.

SAP Policy Measures

Various analysts (see *14*) have discussed the policies adopted to achieve the SAP objectives. A brief discussion of the major policy measures is presented here to put the subsequent analysis into proper perspective.

Exchange Rate Policy

A key issue in the structural adjustment program was to establish a "realistic" exchange rate for the overvalued naira. Naira overvaluation facilitates imports and constrains exports (especially non-oil exports), domestic production, and the inflow of foreign capital. The determination of the exchange rate is effected through the operation of a foreign exchange market in which the exchange rate is set by a bidding process involving the Central Bank of Nigeria (CBN), commercial banks, and licensed money dealers. With the inception of the foreign exchange market, the official (central) exchange rate, which was about 1 naira to the U.S. dollar in 1985, rose to about 7.9 naira to the dollar in 1990. The parallel rate was about 10 naira to the dollar in 1990.

External Trade Policy

The formal objective of policy reform is to liberalize trade, with special emphasis on promoting export trade. Some of the trade-restricting measures adopted under the ESA were either repealed or modified. Import licensing and exchange controls on currency transactions were abolished, as was the 30-percent import levy. The number of commodities on the banned import list was reduced from 74 to 16, and the system of advance payment of import duties was modified. The commodities banned included rice, corn, wheat and wheat products, and vegetable oils. Generally, the banned commodities were those that Nigeria produced, or had the potential to produce, or for which local substitutes existed. The customs and excise duty schedules were overhauled to provisionally reduce the average nominal rate of protection to about 10 percent. A comprehensive tariff structure introduced in 1988 raised the tariff rate above 10 percent, still below the pre-SAP level.

A number of export promotion measures were also adopted. Export prohibition was initially abolished. However, when serious shortages occurred, an export ban was reimposed on grains and roots and tubers. The requirements and procedures for securing approval to undertake other export activities were drastically reduced. Exporters of non-oil commodities were allowed to retain their entire earnings from export activities in a domiciliary account from which they could draw freely to meet eligible foreign transactions. A duty draw-back/suspension scheme was introduced that al-

lowed exporters of manufactured goods to import raw materials and intermediate inputs free of duty and indirect taxes for use in the manufacture of export goods. Other incentives included accelerated depreciation and preferential import licensing.

Fiscal Policy

Another SAP objective was to achieve fiscal balance. This policy thrust was meant to reduce public expenditure, to reflect revenue constraints, and to ultimately keep budgetary deficits within 3 percent of gross domestic product (GDP). The specific measures adopted included:

- Curtailment of public sector wages by capping employment and wage increases.
- Drastic reduction of nonstatutory transfers to all economic and quasi-economic parastatals.
- Selective completion of ongoing projects, with priority to those with high economic viability and high probability of being completed.
- Adequate maintenance of existing infrastructure to facilitate the delivery of public services.
- Refrainment from undertaking new projects, except where such projects were considered crucial for economic recovery and where funding sources were clearly established.

Monetary Policy

The broad objective of the tight monetary policy adopted under SAP was to effectively accrue financial savings, reduce inflationary pressure, and curtail the demand for scarce foreign exchange. One of the earliest policies adopted was to require commercial banks to deposit outstanding external payment arrears in the Central Bank. This measure was aimed at curtailing the demand for foreign exchange and dampening inflationary pressure. In the course of the exercise, 4.2 billion naira were deposited in the Central Bank.

Other policy measures were introduced to limit money supply and foster savings. A 10-percent ceiling was imposed on the rate of credit expansion by the major banks. The rate was adjusted as circumstances demanded. Interest rates were pegged at certain preset levels at the beginning of SAP. Interest rates were completely deregulated by August 1987 to allow for the interplay of market forces. The result was a rapid rise in interest rates (especially lending rates). The treasury bill rate was raised from 10 percent to 14 percent to induce private individuals and organizations to invest in government securities. The minimum rediscount rate was also adjusted downward. The government had set targets indicating what portion of bank credits had to be allocated to preferred sectors. The number of preferred sectors was reduced to two (agricultural production and manufacturing enterprises) with the inception of SAP, and the allocation guidelines were adjusted to give the banks greater flexibility in the allocation of credits.

External Debt Management

Nigeria's external debt reached nearly $27 billion by 1986. The government aimed at minimizing the potential repayment burden of interest and principal, which would constrain economic recovery. The government, therefore, decided that debt service ratios could not exceed 30 percent of export earnings, and negotiated rescheduling agreements with its creditors. A 1984 exercise aimed at reconciling trade arrears was concluded in 1987. Promissory notes were accordingly issued to creditors. A debt conversion program was also adopted in early 1988 as part of efforts to alleviate the debt burden and to attract foreign capital and investment.

Public Sector Reforms

Reducing public expenditure and enhancing the efficiency of the public sector by removing subsidies, and commercializing and privatizing government parastatals were the government's broad objectives. The government invested over 23 billion naira in about 140 public enterprises by 1986. The annual return on investment was estimated at 500 million naira, about 2 percent. The government also paid the principal and interest charges on the borrowed funds used to establish the enterprises, in addition to subsidizing the enterprises to cover their operating losses (*6*). The net return was probably negative if all government payments are considered.

Enterprises were classified into five groups under SAP, according to whether they were to be fully privatized, partially privatized, fully commercialized, partially commercialized, or remain as public enterprises. Full privatization involved the sale of all government shares in the enterprise. The government retained its shares with full commercialization, but the enterprise operated as a profit-oriented venture, charging economic rates for its services or products. In other words, the enterprise no longer received government subvention. The enabling law formalizing the implementation modalities was the Privatization and Commercialization Decree No. 25 of 1988. The decree provided for a technical committee to oversee the implementation of the program.

Special Provisions for Agriculture

The measures proposed for the agricultural sector included:

- Abrogation of commodity boards.
- Shutdown or privatization of public companies that were directly involved in agricultural production.

- Establishment of the Directorate of Food, Roads, and Rural Infrastructure (DFRRI) as a major instrument for fostering rural and agricultural development.

- Increase of the budgetary allocation to the system of Agricultural Development Projects (ADP's) as a major instrument for agricultural development.

- Completion of the One Fertilizer Project and the Savanna Sugar Project.

- Creation of a national program to distribute producer inputs for the cultivation of corn and rice.

- Expansion in palm produce output.

The targets set for rice were 1.1 million tons and 1.5 million tons for 1986 and 1987. The targets for corn for 1987 and 1988 were 3.3 million and 3.6 million tons. A total of 23 oil mills were proposed for the Palm Belt.

Institutions for Implementing Agricultural Policies in SAP

Agriculture was a "residual" sector assigned to the regions as indicated in the 1953 and 1963 Constitutions. Each regional government had a Ministry of Agriculture and Natural Resources. The federal government, however, had responsibility for research, which was located in the federal Ministry of Economic Development. There was also a Federal Department of Agriculture (not a ministry), which supervised the agricultural initiatives of the federal government. The agricultural initiatives included the River Basin Development Authorities (RBDA's), started in 1973, and the World Bank-assisted Agricultural Development Projects (ADP's), started in early 1974.

The federal Ministry of Agriculture was created in 1975 to enable the military government to centralize the control of agriculture. Some of the functions performed by the states' Ministries of Agriculture were taken over by the new federal Ministry of Agriculture. The states were relieved of the burden of importing and distributing fertilizers at heavily subsidized rates. The state marketing boards were also replaced by national marketing boards created for various commodities. Thus, the federal government provides leadership and works in collaboration with the states for the development of agriculture.

The major institutions for implementing agricultural policies (apart from the federal and state Ministries of Agriculture) may be categorized into three broad groups: financial, agricultural, and "others." The financial institutions comprise the CBN, the commercial and merchant banks, and the Nigerian Agricultural and Cooperative Bank (NACB). The agricultural institutions consist of the ADP's, the RBDA's, and the DFRRI. Other institutions include the National Directorate of Employment and the Technical Committee on Privatization and Commercialization.

Financial Institutions

The Central Bank of Nigeria (CBN)

The CBN, probably the single most important institution involved in the implementation of SAP, had a role in the formulation and implementation of the various SAP policies. Apart from its traditional role in the implementation of the government's monetary and fiscal policies, the CBN had crucial roles in the implementation of the exchange and the external trade policies, and in the management of the external debt. The exchange rate policy probably had a greater effect on agriculture than other policies.

The CBN inaugurated the Second-tier Foreign Exchange Market (SFEM) in September 1986, in addition to the first-tier (official) market. All foreign exchange transactions were handled in the SFEM. The only exceptions were payments for public sector debts and payments to international organizations and embassies. These were transacted in the first-tier market. The two tiers were unified into a single foreign exchange market (FEM) in July 1987. The foreign exchange market (whether SFEM or FEM) has three components. The first consists of the CBN, which provides the guidelines and oversees the operation of the market. The second component comprises the authorized dealers and their clients. The third component consists of the authorized dealers in the interbank market.

The foreign exchange rate is determined through a bidding process involving the CBN and the authorized dealers. Initially, the successful bidder paid the marginal rate that exhausted the amount of foreign exchange offered for sale by the CBN. In August 1987, the Dutch auction system, under which bidders were obligated to pay their individual bid prices, was introduced. The CBN also provided guidelines for foreign exchange transactions between licensed dealers and their clients, and in the inter-bank segment of the market. The operation of the foreign exchange market under SAP led to a massive devaluation of the naira.

The CBN also plays a major role in ensuring that financial institutions make credit available to the farm sector. Commercial financial institutions have always been reluctant to lend to agriculture because of the high risk of default and the high administration costs associated with lending to the multitude of unorganized farmers. The CBN prescribes the minimum proportion of the loan portfolios of commercial and merchant banks that must go to agriculture. The CBN underwrites some of the loans for agriculture through the

Agricultural Credit Guarantee Scheme Fund (ACGSF) to allay the concerns of the financial institutions. The number and value of loans guaranteed under the scheme have risen sharply since the adoption of SAP, according to the CBN Annual Report and Statement of Accounts (2).

The Commercial and Merchant Banks

Commercial and merchant banks play a crucial role in the allocation of credit to the farm sector, apart from the foreign exchange transactions. Agriculture and manufacturing were the high priority sectors during the SAP period. The CBN accordingly prescribed targets indicating the minimum proportion of the loans and advances of commercial and merchant banks that must be allocated to each of the preferred sectors. The minimum targets were raised in 1986 (app. table 1). Since then, the banks have, on average, increased the relative allocation to agriculture and exceeded the minimum rates in 1988 and 1989. The loans were largely guaranteed by the CBN under the ACGSF.

The Nigerian Agricultural and Cooperative Bank (NACB)

The NACB was established to meet the special needs of the agricultural sector in recognition of the apparent discrimination faced by agriculture in the competition for credit. The total amount of loans made available to agriculture by NACB increased significantly in the SAP years of 1988 and 1989 (app. table 2). It is significant that the allocation to crops rose relative to the allocation to livestock and fishery, underscoring the emphasis placed on crops in SAP.

Agricultural Institutions

Agricultural Development Projects (ADP's)

The ADP's are World Bank-assisted rural integrated agricultural development projects created to enhance agricultural productivity by providing rural infrastructure, improving farm inputs, and introducing new farming techniques. The first ADP's were inaugurated in the mid-1970s as enclave projects covering only small portions of the few states in which they were being implemented. Most states of the federation now have ADP's, and the current trend is to make them statewide. Financial allocation to the ADP's has increased significantly since the adoption of SAP. The ADP system was considered to be the primary instrument for agricultural development when it was inaugurated. Other important institutions (DFRRI, for example) have been established in addition to the ADP system.

The River Basin Development Authorities (RBDA's)

The RBDA's, referred to as the River Basin and Rural Development Authorities (RBRDA's) until 1989, had a broad spectrum of functions ranging from land preparation and irrigation for farmers to commercial ventures, including poultry and arable farming, fishing, feed milling, food processing, and the marketing of farm inputs. Efforts to effectively restructure the RBRDA's in 1986 sought to divest them of direct involvement in agricultural production and other general rural development functions, and to focus them on developing surface and underground water resources for irrigation and human consumption. The number of RBRDA's was reduced from 18 to 11 to coincide with the main watersheds of the nation. The adjustment of the name to RBDA was apparently a reflection of the severance of the rural development functions which were transferred to the Ministry of Agriculture and Rural Development.

The Directorate of Food, Roads, and Rural Infrastructure (DFRRI)

DFRRI, established in early 1986, became a major instrument for agricultural development in the SAP period. Its objectives may be divided into three broad categories. The first objective was to improve the quality of life and the standard of living of rural people by improving their nutritional status, raising the quality of rural housing and health care, enhancing rural employment opportunities and incomes, and improving the capacity of the rural sector to produce and consume a wider range of goods and services. The second objective was to harness the "enormous resources" of the rural areas in an effort to promote an integrated, sociocultural, political, and economic development of the nation. The third objective was to facilitate the participation of the masses in the development process through the effective mobilization of the rural populace.

DFRRI initiated programs in the areas of rural road construction and rehabilitation, rural water supply, rural electrification, rural industrialization, technology development, and agricultural development to achieve these objectives. Available data indicate that DFRRI has made considerable progress in the provision of rural infrastructure and in the promotion of productive activities in agriculture and small-scale industries (2).

Other Institutions

The National Directorate of Employment (NDE)

NDE was inaugurated in 1986 to combat mounting unemployment. NDE articulated employment programs in four main areas: youth employment and vocational training, agricultural programs, small-scale industries and graduate employment, and special public works.

The youth employment and vocational skills program consists of two schemes: open apprenticeship and the "waste-to-wealth" scheme. In the open apprenticeship scheme, young people are attached to private and public organizations, for 2 or 3 years, to learn vocational skills. These skills should enable them to get established on their own, or seek employment in the various sectors of the economy. In the

waste-to-wealth scheme, youths are trained to turn discarded objects (such as jewelry, shoes, and ashtrays) into tradeable products.

The agricultural program has two components. The first consists of training school dropouts for 1 year in farming skills, giving them 1 hectare of land, and extending them loans to enable them to start farming. In the second component, university agriculture graduates are granted land and loans to start farming.

University graduates and other young entrepreneurs are encouraged to establish small-scale enterprises to generate employment for themselves and others in the small-scale industries and graduate employment program. The NDE guarantees the loans given to participants. Unemployed youths are employed to implement projects in their local government areas in the special public works program.

The Technical Committee on Privatization and Commercialization (TCPC)

TCPC, set up under Privatization and Commercialization Decree No. 25 of 1988, was charged with implementing policy on privatization and commercialization of identified public sector enterprises. The committee was to advise the government on the required change in the capital structure of the affected enterprises. The committee was to oversee all the activities leading to the public issue of shares for enterprises that were to be privatized, including negotiating the price of each issue with the Exchange Commission and supervising the sale of shares by the issuing houses.

Comparisons in Agriculture

The following section seeks to draw inferences by examining changes in the variables of interest as depicted by available data. The use of sophisticated tools to associate effects with specific policies is limited by lack of available data. Although SAP has been in force for 5 years, annual time series data are available for only 1987-89. Thus, this analysis depends on comparing the data for those 3 years with those for the 3 years immediately preceding SAP (1984-86).

The effects anticipated by policymakers give an indication of the variables that should form the focus of the analysis here. It was anticipated that macroeconomic policies and the special provisions for agriculture would achieve the following:

- A rapid increase in food production to reduce imports.
- Increased sourcing of industrial raw materials from domestic output to reduce import dependence.
- Increased output of traditional export crops (such as cocoa, palm produce, rubber, and cotton) to diversify the export base and enhance foreign exchange earning capacity to reduce the overbearing dependence on oil exports.
- Maximized growth in value-added and the generation of employment in the industrial sector, which would be enhanced by increased output and domestic processing of agricultural raw materials.
- Increased rural employment and incomes and improved welfare, arising from the boom in agricultural production and rising agricultural prices.

Considering the anticipated effects of SAP on agriculture, the analysis would focus on changes in agricultural prices and production, changes in the rate of investment in agriculture, the supply and demand for farm inputs, and the profitability of farm enterprises. The analysis would also examine changes in the structure of agricultural exports, the composition of final consumption, and employment generation. The analysis includes a brief discussion of the socioeconomic effects of SAP to give a more complete indication of the change in welfare.

All changes can hardly be attributed to SAP alone, given the numerous environmental factors that affect agriculture. For instance, drought conditions and a high incidence of pests (locusts and quila birds) likely had adverse effects on agricultural production in 1987. However, production data from some sources, surprisingly, do not reflect this. Data from the United Nations Food and Agriculture Organization (FAO), which are normally official country data, indicate that cereal production actually peaked in 1987 (*8*).

The situation reveals a major difficulty in analyzing farm data in Nigeria. The variability of data from different sources is sometimes staggering. For example, while FAO's estimate of the production of roots and tubers in 1989 is 34.6 million tons, the CBN's estimate is 15.7 million tons. Where production data from more than one source exist, and there is no strong support for choosing either one, what has been analyzed is the average of the data. The point is that the difference in the magnitudes of a selected variable for the pre-SAP and SAP periods cannot be entirely attributed to SAP. There are numerous other factors, including the quality of available data, that can explain the change. Because we are interested in trends rather than absolute levels, the analysis may be useful as long as data biases are consistent.

Agricultural Prices

Increase in General Price Level

Data in table 3 indicate that after peaking in 1984 total inflation resumed again after 1986, reaching 38.3 percent in 1988 and 40.9 percent in 1989.

One of the primary factors blamed for Nigeria's inflation is the devaluation of the naira. Because Nigeria is still heavily import dependent, the massive devaluation resulted in rapid increases in the prices of imports, including production inputs, which were transmitted to the cost of production of consumer items and food. The cost-push effect contributes significantly to the higher price of output.

The naira devaluation was reinforced by the rapid growth in domestic liquidity, a result of the government's failure to adhere to set fiscal and monetary targets. For example, the aim of containing the budgetary deficit within 3.5 percent of GDP was never met (table 4). Revenue accruing to the federal government rose by an average 27 percent per year between 1986 and 1988, while total expenditures rose by 30 percent, according to Ojo (*14*). In addition, the state governments maintained significant budget deficits, although their deficits declined significantly during the period. The rapid growth in bank credit resulted in rapid expansion of the money above planned targets. Thus, the continuing naira devaluation, and the expansionary monetary and fiscal policies adopted in 1988, fueled the rapid rise in the general price level.

Why did the government fail to adhere to fiscal and monetary targets? The greatest divergence between the targets and actual performance occurred in 1988 (table 4). Real GDP, which had recorded a positive growth rate in 1986, fell back to a negative rate in 1987 under the effect of weakening exports from the oil and gas sector. Oil and gas exports have accounted for 90 percent of merchandise exports and three-fourths of the federally collected fiscal revenue, while accounting for only 15 percent of GDP in recent years. Also, external debt service rose to 86 percent of exports of goods and nonfactor services in 1988, a year in which there was no debt relief. Unemployment remained high, and the pressure on domestic prices and the balance of payments persisted. The judgment in 1989, as indicated by CBN (*2*), was that in order to further stimulate aggregate domestic production, consolidate the gains made, and reduce unemployment it was essential to reflate the economy.

Monetary and fiscal controls were relaxed relative to previous years. The result was that GDP (measured in 1984 constant factor cost) increased by 4.2 percent, but unemployment persisted. The balance of payments declined from a surplus of 159.2 million naira in 1987 to a deficit of 2.3 billion naira in 1988, and the rate of inflation escalated. The composite price index rose by 38.3 percent in 1988, compared with only 10.2 percent in 1987. The efforts to boost the economy in 1988 apparently proved premature, and by 1989 the monetary and fiscal controls were again tightened.

Food and Nonfood Price Increases

The data in table 3 do not support the conventional notion that inflation is an urban affair, as rural inflation rates were higher than urban inflation rates for 1987 and 1988. Real urban retail prices of food increased significantly after the inception of SAP. Real urban retail prices of domestically produced staples such as rice, maize, beans, gari, and yams all increased (table 5). Analysis by Ojo indicates that the food component of the composite price index, which accounts for over 60 percent of any change in this index, increased by 52.2 percent in 1988 and 39.1 percent in 1989, as compared to an average increase of 10.2 percent between 1985 and 1987 (*14*).

Some analysts note that the onset of the rapid escalation of food prices coincided with increases in fuel prices. The decline of the fuel subsidy must have affected agricultural prices, judging by the general increase in transportation costs that accompanied the reduction of the fuel subsidy under SAP and the increasing use of trucks (rather than trains) to haul foodstuffs from the north to the south. Yet, considering the fact that a considerable number of the trucks use diesel rather than gas, and that the price of diesel fuel was raised much later, and by a lower fraction, the contribution of the lower fuel subsidy to the increase in agricultural price is probably exaggerated.

Producer and Retail Price Increases

Real producer prices of all food crops, except yams and cassava, and real producer prices of all cash crops increased under SAP. These price increases can be seen by comparing table 5 with table 6.

The ratio of domestic producer price to world price is an indicator of the relative advantage of domestic production. The divergence between world and domestic prices has narrowed significantly (as indicated by the declining ratio of producer price to world price) for the food crops that were hitherto not traded (cassava, sorghum, millet, and beans), or have become nontraded through the import bans (rice and maize). The domestic prices of these crops previously exceeded external prices. The apparent reduction of the prices of nontraded food crops relative to external prices is, as expected, an indirect effect of the devaluation of the naira (table 7). If the difference between domestic and international inflation rates is taken into account, Nigerian producer prices for food and cash crops may actually have fallen below international levels.

The ratio of domestic price to world price increased for most export crops as the tax imposed on exports by the marketing board system and the overvaluation of the naira was reduced with the implementation of SAP policies. The exceptions are palm oil and rubber, which virtually ceased to be exported even before the inception of SAP. The domestic capacity for processing palm oil into refined vegetable oil has increased since the mid-1980's ban on imports of vegetable oils. The domestic capacity for processing natural rubber, particularly into tires and tubes, has also increased significantly. Thus, there appears to be a shift of resources from exports to production for domestic use, resulting from import substitution policies affecting these two commodities. A comparison between the mean price ratios (food and cash crops) indicates that food prices, despite SAP, remained higher than world prices (range of ratios from 1.6 to 2.76) relative to cash crop prices (range of ratios from 0.23 to 1.94).

Factors in Crop and Food Price Changes

The factors that appear to have contributed to rising crop prices may be classified as natural and SAP-induced factors. Natural factors (especially inadequate rainfall and pest infestation) could have caused a decline in output in 1987 and thus could have contributed to the steep price rise in 1988. However, output data from different sources differ and it is hard to conclude that these factors affected output in that year.

Clearly, the most important SAP-related factor in rising agricultural prices has been the exchange rate adjustment for the naira. This factor had pervasive effects on the entire agricultural sector, as discussed in the sections of this report on input markets and consumer price inflation.

The devaluation of the naira primarily contributed to higher agricultural prices in two ways. First, the abrogation of the marketing boards linked the Nigerian market with the international market for cash (export) crops. Second, the massive devaluation of the naira gave an enormous boost to domestic prices of export crops. The situation is such that even when global prices are falling, the continuing depreciation of the naira sustains higher domestic prices. The devaluation of the naira also contributes to rising domestic prices, especially of food crops, through its contribution to the raging inflation.

Rising prices could be partially attributed to the increasing demand for some agricultural commodities as raw materials for local industries. This increasing demand stemmed partly from higher industrial output and partly from the ban on imports that covered most agricultural raw materials, such as maize. As a re-sult, local processing plants (feed mills, flour mills, and breweries) became dependent on local output for their raw materials. A similar ban also extended to imports of staple food grains (wheat and rice), contributing to their higher prices.

Other SAP-induced factors influenced agricultural prices. The existence of lower consumer price distortion after SAP than producer price distortion before SAP led to a slower rise in retail prices than in producer prices after SAP. Also, it has been argued that the drive to earn foreign exchange prompted food exports to neighboring countries, thereby causing domestic shortages. The government's response to reports of food exports was to reimpose the ban on exports of grains, roots, and tubers. The mystery is that claims of large-scale food exports have hardly been substantiated. The few proven truckloads moving across the border could not affect the entire Nigerian market.

Production

Production tended to respond positively to rising output prices. The index of agricultural production was 5.5 percent higher in the SAP period than in the pre-SAP period (table 8). Moreover, the average contribution of agriculture to GDP grew in absolute terms from 29.11 billion naira in 1985-86 to 33.03 billion naira in 1987-89, and in relative terms from 38.2 percent to 40 percent (table 9).

Sectorwise, the index of agricultural production was higher in the SAP period than in the pre-SAP period for all the subsectors of agriculture except livestock. The relative contributions to GDP of livestock, forestry, and fishery were lower in the SAP period than in the pre-SAP period, in contrast to a strong showing by the crops subsector. The apparent neglect of these subsectors probably accounts for their relatively poor performance since, except for macroeconomic policies that affect the whole economy, there were no policies aimed specifically at livestock, forestry, or fishery. The crops subsector, aside from enjoying the considerable advantage of the ban on staple grain imports, benefited from the special SAP provisions for agriculture that had direct relevance only for crops.

Aggregates may, however, mask the differential effect of SAP on specific crops. Not all crops fared equally well under SAP, as data in table 10 indicate. The average annual output of sorghum, cassava, natural rubber, and palm kernels was less for the SAP period (average 1987-89) than for the pre-SAP years (average 1984-86). The production of sorghum and palm kernels declined by 4 percent and 4.5 percent per year during the SAP period. The aggregate output of cereals was marginally less by 0.5 percent. Production of roots and tubers was 5.9 percent higher, however. These are short-term comparisons, and may be affected by weather as much as by SAP-related factors.

The rapid increase in groundnut and cotton production since the inception of SAP, stimulated by price increases of 153

percent and 243.4 percent, was made possible in part by an expansion of area (table 11), to some extent at the expense of competing cereals, where the largest price increase was only 133.9 percent for rice.

Since cash crops like cocoa and oil palm are not annuals and take several years to mature, increased output could not have come as a result of recent price increases, but probably from improved maintenance and more efficient harvesting and processing of existing plants. Examining trends in data on recent plantings, if available, would be a better way to assess producers' response to rising prices.

Production changes cannot be entirely attributed to SAP policies. Disease, pest infestation, and inadequate rainfall could have marred production in 1987. Available production data, however, do not show that 1987 was much worse than other years. Although total rainfall was the lowest in 1987, the mean annual rainfall was actually marginally higher in the SAP period than in the pre-SAP period (table 12). Rainfall is highly variable geographically, however.

Calculations based on data in table 11 show that aggregate area cultivated declined by 7.3 percent per year during 1987-89, attributable to lower area cultivated in cereals; yields were higher in the SAP period than in the pre-SAP period, except for cassava and groundnuts. Factors that could have influenced yield include increased use of improved inputs and increased investment in agriculture. These are among the instruments used to promote agriculture under SAP and will be considered in the next section.

Input Markets

Supply of Variable Inputs

The basic issues in the supply of and demand for farm inputs concern access, price, and quantities utilized by farmers. Some of the analyses during the early implementation of SAP indicated that SAP would have a negative effect on supply and use of farm inputs. In his analysis, Titilola contended that the operations of the foreign exchange market would lead to rapid increases in costs and, hence, would dampen the demand for imported inputs (fertilizers, agrochemicals, farm machinery, and equipment) (*20*). Akande, analyzing data from major distributors of agrochemicals, confirmed that the prices of agrochemicals had risen and that the volume and profitability of trade in agrochemicals had declined. He concluded that, given the fall in supply and rise in prices of agrochemicals, farmers would reduce the use of inputs (*1*).

Data on the quantity of imports of agrochemicals and their application are not available. Data on fertilizers and tractors do not seem to support the above conclusions for input supply. Domestic production of fertilizers has rapidly increased since 1987, reflecting the emphasis placed on expanding local output of fertilizers during the SAP period. The mean net supply of fertilizers per annum was 19.4 percent higher in the SAP period than in the pre-SAP period (table 13). The mean number of tractors in use in the SAP period was 7.5 percent higher than before SAP (table 14).

Investment in Agriculture

The apparent increase in the aggregate supply of improved farm inputs was probably engendered by the increased financial investment in agriculture. Indications are that financial allocations to agriculture by government and various agencies rose after the inception of SAP, although comprehensive statistics are lacking. Calculations based on data in table 15 indicate that the average annual investment in agriculture was about 80 percent higher in the SAP period than in the pre-SAP period.

Increased financial investment resulted in the expansion of agricultural and rural infrastructure. The ADP's and the RBDA's provided more kilometers of rural feeder roads, earth dams, boreholes, tubewells, and wash-bores. DFRRI has completed work on a significant proportion of the 30,000 kilometers of roads that it was to provide in the first phase of the rural feeder road scheme. The program also covered the development of rural water supply and electricity. DFRRI also sought to enhance agricultural productivity by investing in the development, multiplication, and distribution of improved seeds and breeds of livestock. Consequently, not only was the aggregate supply of improved inputs increased, but the infrastructures required to facilitate input supply and output marketing were expanded.

Farm Level Use of Improved Inputs

Data from the ADP's and the RBDA's point to increased supply of inputs in the SAP period. The data indicate that the supplies of fertilizers, land clearing services, and pesticides/fungicides increased significantly in the SAP era (table 16). Input distribution problems remained, however, and heavily impacted farmer use of these inputs. The ADP's and the RBDA's, which received direct allocations from the federal Ministry of Agriculture instead of purchasing fertilizers on the open market, appeared to have had stockpiles of fertilizers, explaining the disparity in the supply numbers in tables 13 and 16, and suggesting the existence of valuable secondary markets. (The ADP's and the RBDA's covered only small enclaves in the states in which they operated during the period under consideration. Thus, the proportion of farmers covered by these institutions was small, and would by no means be considered representative of Nigerian farmers as a whole.) There is also, of course, the problem of poor records at the national level and the lack of data from the field.

The declining consumption of fertilizers and some other inputs at the farm level revealed by sample surveys may have been due to a combination of supply and distribution problems. The World Bank has attributed the problem of low fertilizer consumption in Nigeria to inadequate and unpredictable supplies emanating from the "fiscal burden of the high subsidy rates, and the inefficiency of public sector fertilizer operations" (*23*). Nigerian farmers were paying black market prices for fertilizer in 1990, which were several times higher than official fertilizer prices (*4*).

Available empirical evidence from sample surveys indicates that since the inception of SAP farmers have applied more of some inputs than others. Households in Imo state have, on average, applied less agrochemicals and fertilizers and more hired labor and tractor services during the SAP era (table 17). Use of purchased inputs generally declined in 1988 and 1989, a trend not consistent with the image of increasing supply as depicted by the aggregate data.

The declining use of purchased inputs is not to be fully explained by changes in input prices. All data sources agree that prices rose in nominal terms. Agrochemical prices rose by at least 30 percent between 1986 and 1987, according to Akande (*1*). Farm input prices recorded in the sample survey in Imo state have increased significantly since the inception of SAP (table 18).

The key factors appear to be the reduction of the subsidy on some of the inputs, the devaluation of the naira, and the general increase in the price level. The reduction of the subsidy on fertilizers was already in progress before the inception of SAP. The Federal Agricultural Coordinating Unit (FACU) blamed the subsidy reduction for the decline in the proportion of households applying fertilizers from 73 percent in 1985 to 68 percent in 1986 (table 19).

Price analysis in real terms, however, shows a different picture. The current rate of subsidy on fertilizer indicated in the 1991 budget is 30 percent. However, if the devaluation of the naira is correctly gauged, the effective fertilizer subsidy rate is much higher than this. Over 40 percent of the domestic supply of fertilizers is derived from imports. The devaluation of the naira has contributed to the rapid rise in the price of imported fertilizer, which is absorbed by the government. One source has put the current subsidy rate at 80 percent.

The data on loans and advances available to the agricultural sector suggest that farmers had increased access to agricultural credit under SAP. However, financial institutions showed a bias toward large-scale agricultural projects (especially livestock and poultry) in their lending operations in order to minimize their losses (arising largely from a high rate of default and the cost of administering and supervising the use of loans). Thus, the positive trend in the aggregate data revealed by table 15 should not be taken to mean that smallholders received more loans. A vast proportion of these probably went to a handful of large-scale producers rather than to the many scattered and unorganized smallholders.

Available data and analysis appear to indicate that SAP has engendered increased investment in agriculture and augmented the supply of improved inputs. While fewer farmers appear to use fertilizers and agrochemicals, and in smaller quantities, more appear to use tractor services. The rapid rise in the prices of farm machinery and equipment appears to hinder the growth of large-scale farming that depends heavily on such equipment. Some large-scale agricultural projects were abandoned because of cost escalation (*21*). Vaccine prices have risen rapidly, causing negative effects on the livestock subsector (*11*). The situation has been exacerbated by interest rate deregulation. The rapidly rising interest rate imposed a heavy debt repayment burden on commercial operators, causing many to fold. New commercial, large-scale crop farms are now rare.

Profitability of Crop Production and Transfer of Resources to the Farm Sector

Financial investments in agriculture already indicate the increasing transfer of resources to that sector. However, given the nature of these investments, which may not entail direct allocation of resources (in cash or kind) to smallholders, the ultimate indicator of resource transfer is probably the profitability of farm enterprises. There are indications that since the inception of SAP crop production has been profitable. The fact that households are using more hired labor is probably one such indicator. Labor is usually the highest cost factor in traditional agriculture that depends on hand tools. Experience also shows that since the inception of SAP, more people have moved to agriculture on a full- or part-time basis. The need for supplementary income to meet food requirements has forced many urban dwellers to turn to part-time farming in villages near the cities and even on vacant property in the cities. Many people who retired from their regular employment in the wake of SAP have also taken up farming.

Although there are no national data for analysis, indications are that output prices have risen relatively faster than input costs, increasing the profitability of crop production. This conclusion finds support in the results of a sample survey in Imo state, which show dramatic increases in profitability of crop production measured in current naira since the inception of SAP. Although the average farm size has declined, the gross return per hectare has increased by 102 percent, and the nominal gross return per household has increased by 76 percent (table 20). The increase is much less when measured at constant 1985 factor cost.

In his study of Nigeria's producer subsidy equivalents/consumer subsidy equivalents (PSE's/CSE's), Mabbs-Zeno applied a measure that provides some estimates of the financial transfers to farmers resulting from specific policies and indicates the level of transfer of resources to agriculture (*10*). Subsidy equivalents provide estimates of the amount of compensation that would have to be paid to producers (or the additional cost that would have to be incurred by consumers) to keep their "net welfare" unchanged following the elimination of a particular government policy. The government subsidizes producers if the PSE is positive and taxes producers if the PSE is negative. The CSE, similarly, measures the impact of government policies on the budget costs of consumers of specific commodities.

The major input policy measures quantified by Mabbs-Zeno were pesticides, credit, and fertilizer subsidies. Others were tariffs, quantitative restrictions, foreign exchange controls, and marketing boards. The analysis covered some export crops (cocoa and cotton) and some imported food crops (corn, rice, sugar, and wheat). According to Mabbs-Zeno, pesticide subsidies affected only the production of cocoa; fertilizer and credit subsidies affected the output of all crops (except cocoa, with respect to fertilizer subsidies). Tariffs are applied to the consumption of cocoa and wheat and to the production and consumption of corn, rice, and sugar. Nontariff barriers applied to the output of rice and the production and consumption of wheat. The marketing board operations affected the production of cocoa, wheat, and cotton. Foreign exchange adjustments affected the production and consumption of all crops except the production of white corn. The important border trade barriers had no effect on Nigerian white corn producers who produced it for direct human consumption.

The list of policies considered is not exhaustive. Some policy measures have been excluded either because they are not quantifiable, or because the relevant data are unavailable. A typical case is the irrigation subsidy, which is the basis for wheat production in Nigeria. The implication is that the subsidy equivalents calculated should be regarded as being indicative. A summary of the transfers to producers of the selected crops, resulting from implementing the policies discussed above, is presented in table 21.

The only policy that imposed a tax on producers in the pre-SAP period is the result of the overvaluation of the naira. The tax burden that this policy alone imposed on producers was greater than the combined subsidies provided by all the other policies; hence, the negative total transfer (overall tax) to farmers. The tax imposed by foreign exchange controls has been drastically reduced, following the devaluation of the naira in the SAP period. It has not been eliminated, however, as the transfer from that policy instrument is still negative. The naira was apparently still overvalued in the 1987-89 period. However, both the total revenue and the total transfer to producers increased dramatically in the SAP period.

The output of wheat, cotton, corn, and cocoa has increased significantly, but declined in the case of rice and sugar, in the SAP period. Crop prices have risen rapidly and, accordingly, the value to producers has risen, even when output has declined and there has been no cash transfer to producers. The total policy transfer was negative for wheat, sugar, cotton, and cocoa, indicating that production of these crops was taxed by government policy in the pre-SAP period. The most heavily taxed crop during this period was cocoa, while rice and corn were subsidized. All crops except cocoa became subsidized with the inception of SAP. While cocoa was still taxed, the level of taxation was reduced by almost half. The implementation of SAP policies has generally eliminated (or reduced) the tax burden on the production of crops. In that respect, SAP policies have facilitated the transfer of resources to the farm sector. An indication of PSE's as they affect specific crops is given in table 22 and appendix table 3.

Effects of SAP on Consumption of Domestic Farm Products

The level of consumption of major staples should indicate how well the agricultural sector has performed in bridging the gap between supply and demand if the ban imposed on food imports since the inception of SAP is effective. That level should also give some indication of the change in the welfare of Nigerians. However, there are at least two problems with this approach. First, the available data cover only 2 years (1987 and 1988) after the inception of SAP. Second, the available consumption data appear to have been derived by dividing estimated aggregate production by population estimates, with some allowance for seeds, feeds, industrial use, and trade. Thus, the consumption estimates are only as good as the production and population estimates on which they are based. As previously noted, there are serious problems with crop production and population estimates.

Per capita consumption of cereals, pulses, and fruits has increased over the last few years, but has declined for roots and tubers, vegetable oils, and sugar (table 23). The increased consumption of pulses, especially beans which are relatively rich in vegetable protein, is a result of a growing dearth of animal protein. Beans are also consumed in various forms as a substitute for bread at the breakfast table.

The increased consumption of cereals, when available data indicate that production has declined, would imply either a stockpile of cereals or an inflow of supplies from across the border, the ban on imports notwithstanding. Unofficial trade across the border, especially in wheat, wheat products, and rice, is believed to have significantly increased since the im-

port ban was imposed. World Bank estimates, based on USDA data, put the quantity of rice and wheat smuggled into Nigeria at between 400,000 and 500,000 tons, per year, from 1987 to 1989 (*23*).

A better indicator of the nutritional status of Nigerians is the level of consumption of food nutrients. The average per capita quantities of calories, protein, and fat consumed declined between 1986 and 1988, relative to the quantities consumed during 1975-79 and 1980-85 (table 24). According to these data, Nigerians were less well-fed in the first 2 years of SAP. If nutritional status is used as a measure of welfare, then there has been a decline in welfare as well. Nigerian calorie and protein intake levels were below both the FAO/WHO standards (2,200 kcal. and 63 grams of protein per capita, per day), and the Idusogie standards (2,192 kcal. and 53.8 grams of protein per capita per day), even before SAP.

A traceable link between the welfare of consumers and government policies is the impact of policy measures on the cost outlay of consumers. The consumer subsidy analysis by Mabbs-Zeno provides some evidence in this respect. The overvaluation of the naira (resulting from foreign exchange controls), which facilitated imports and constrained exports, subsidized the consumption of crops beyond the magnitude of the combined tax effect of tariffs and other nontariff barriers (table 25). This explains the overall positive transfer of 115.7 million naira in the pre-SAP period. The tax burden imposed on consumers by tariffs and non-tariff barriers increased significantly with the inception of SAP. The subsidy provided by the overvaluation of the naira decreased considerably but remained positive, indicating that the equilibrium exchange rate had not been attained. The "transfers percent of costs" declined from a positive 5.3 percent in the pre-SAP period to a negative 16.5 percent in the SAP period, indicating that the overall tax burden on consumers had increased dramatically.

The data indicate that the level of consumption has declined for all crops since the inception of SAP, yet the consumer outlay for each commodity has increased because of the rapid rise in prices. Nigerians consumed less, but paid more, for the affected commodities during the SAP period. However, Nigerians enjoyed a considerable subsidy on all the commodities, with the exception of rice, before SAP. The SAP policy measures caused a reduction of the subsidy to consumers of sugar, and imposed an outright tax on consumers of wheat and cotton. The tax on the consumption of rice, high in the pre-SAP period, was drastically reduced (appendix table 4). SAP appears to have had generally adverse effects on the consumption of these commodities. However, it could be argued that the pre-SAP policies distorted consumption levels above what could be sustained by the Nigerian economy. The huge import bills, financed partially through external debts, would lend credence to this premise. The effects of policy measures on consumers of specific commodities are summarized in table 26.

Export Markets and Contribution to Foreign Exchange Earnings

The decline in agricultural output in the 1970's translated into a decline in exports. Nigeria had become a net importer of its traditional export crops, except for cocoa, palm kernels, and natural rubber by the early 1980's. The situation has not changed significantly since the adoption of SAP. The quantities of exports of even cocoa and palm kernels are still below levels attained in 1955-64 (table 27). However, the decline in exports before and after the adoption of SAP is partly accounted for by the increasing demand for some of the crops by local processing and manufacturing industries. The emphasis during SAP was to increase the value added and generate employment through increased local processing. In this regard, the Government had actually planned to ban the exports of cocoa and palm produce by January 1991. However, because of the inability to develop sufficient domestic processing capacity by that date, the decision was rescinded.

The rise in the value of agricultural exports since the inception of SAP has been significant. Local traders gained direct access to world markets with the abrogation of the commodity boards. The massive devaluation of the naira meant that the naira equivalent of agricultural export earnings grew rapidly and the domestic prices of export crops received a tremendous boost (see previous discussion on cash crops). The major contributors to foreign exchange earnings are cocoa, natural rubber, and palm kernel. Foreign exchange earned by agricultural exports between 1986 and 1988 in U.S. dollars was about 48 percent higher than that earned between 1983 and 1985 (table 28).

The contribution of non-oil exports (especially agricultural ones) to foreign exchange earnings is increasing. The agricultural sector's contribution to GDP has increased in both absolute and relative terms since the inception of SAP: from 29.11 billion naira annually in 1985-86 to 33.03 billion naira annually in 1987-88, or from 38.17 percent of GDP to 40.02 percent (table 9). Similarly, agriculture's contribution to foreign exchange earnings increased in both absolute and relative terms: from 308 million naira annually in 1985-86 to 2.37 billion naira annually in 1987-88, or from 3.2 percent of total export earnings and 71.1 percent of non-oil export earnings annually in 1985-86 to 7.3 percent and 78.9 percent, respectively, annually in 1987-88 (table 29).

The amount of foreign exchange earned that is available for reinvestment in Nigeria or is used by the government for external transactions is uncertain. In this context, there has been the problem of nonrepatriation of earnings. Some exporters who entered the agricultural export trade after the ab-

rogation of the commodity boards simply used agricultural exports as an avenue for converting naira into hard currency. For such exporters, the earnings were usually not repatriated and were not available to the government for external transactions. It is in this regard that SAP is said to have fostered capital flight. Domestic foreign currency accounts were introduced to resolve this problem. This system allowed non-oil exporters to retain their export earnings in hard currency on which they could freely draw to meet legitimate foreign exchange transactions.

Another problem resulting from the abrogation of commodity boards was the lowering of the quality and, therefore, the value of agricultural exports, particularly cocoa. The commodity boards had maintained certain standards and insured the quality of export crops. The mass entry of new traders into the cocoa export market in the wake of SAP resulted in exports with high impurity content, some adulteration, and weight manipulations. There were also long delays in the delivery of cocoa to importers (*21*). The need to reorganize the commodity export trade to enforce standards and maintain quality probably provides the rationale for the formation in recent years of a few private commodity organizations, especially the Cocoa Association of Nigeria.

Other Socioeconomic Effects and Policy Responses

SAP is a national policy package that affects all sectors of the economy. This analysis can hardly be called complete without considering the effect of SAP on other sectors besides agriculture. However, comprehensive and indepth empirical studies of the impact of SAP on the Nigerian economy are difficult to find. As a result, the synthesis here relies heavily on the analysis of specific sectors by various researchers (see *5*, *14*, *15*, *16*, and *19*).

Available reports indicate that the changes that have occurred in Nigeria's economy since the adoption of SAP have been mixed. Positive changes include: increased productivity, capacity utilization and use of local inputs in manufacturing, more efficient allocation of resources, increased export activity, and an increased share of capital goods in total imports. Negative changes include: higher cost of production, higher consumer prices, and reduced consumer purchasing power.

Capacity Utilization

Gains in Nigeria's GDP have been uneven since the start of SAP. The industrial sector appears to have shown more sustained growth than the agricultural sector, however. The index of industrial production rose by an average 9.3 percent per year between 1986 and 1989, far above its average growth rate in 1981-85. Capacity utilization of the manufacturing sector rose from 37 percent in 1985 to 42.4 in 1989 (2). The rate of capacity utilization was relatively higher in such industries as breweries and textiles, which achieved a higher rate of utilizing local resources.

Structural adjustment, particularly the devaluation of the naira and the consequent escalation of import prices, appears to have caused a significant rise in the cost of production for most manufacturing industries. The prevailing situation, characterized by high production costs, higher consumer prices, and reduced consumer purchasing power, appears to constrain domestic demand and the growth of capacity utilization of the manufacturing sector.

Exports and Imports

SAP appears to have fostered increased export activities, particularly in those industries that derive a substantial proportion of their inputs from local sources. The devaluation of the naira appears to have increased the competitiveness of these industries in the international market.

Calculations based on the data provided by CBN show that the structure of imports is changing. Consumer goods as a share of total imports have declined from an average 32 percent per year in 1984-86 to an estimated 27 percent in 1987-89. The average share of capital goods and raw materials has increased from 67.6 percent to 73.3 percent during this time (2). Furthermore, the share of food in total imports has declined, probably because of the ban on food imports. Thus, there has been a shift from the importation of consumer goods (including food) to the importation of capital goods and raw materials since the adoption of SAP.

Resource Allocation

Structural adjustment has yielded positive results in inducing more efficient allocation of resources, according to Ojo. Ojo states that with respect to resource allocation, SAP tended to redress the imbalance between the rural and urban areas. The flow of resources to rural areas resulting from increased investment in infrastructure has increased. Rural incomes are rising as agricultural and other activities increase and terms of trade are enhanced. Some return migration of able-bodied persons to rural areas is already evident. Brighter prospects exist for raising productivity in the rural areas.

A more efficient allocation of resources has also derived from policies that have tended to reduce the bias against production for exports. The removal of the tax on agricultural exports, the abrogation of the commodity boards, and the consequent scramble to get into agricultural export trade constitute a case in point. The quest for foreign exchange has also fostered production for exports in the manufacturing industries. The process of procuring foreign exchange has become less cumbersome and probably less expensive. This

process has made for a greater flow of resources into production rather than into the distributive trade (with higher and faster rates of return), as was the case in the pre-SAP era.

Efficient allocation of resources was furthermore derived from the growing "maintenance culture," changing attitude toward menial jobs, and an economic environment that is largely devoid of controls. There is a growing awareness of the need for proper maintenance and repair of existing durable assets. The culture, particularly in the public sector, of allowing durable assets to fall into disrepair or of easily discarding malfunctioning equipment and buying new ones that prevailed in the boom years is being replaced by the maintenance culture. Related to this culture is the increasing awareness that in the face of a foreign exchange crisis and growing external indebtedness, self-reliance has become crucial to the survival of the nation. Accordingly, there has been a shift in consumption from imported to local goods. The devaluation of the naira has played a role in changing attitudes toward locally produced goods.

Economic Environment

A growing change in attitude toward certain jobs has become evident. In the past, anyone who had completed high school education did not want to be a farmer, tailor, carpenter, motor mechanic, or refuse collector. Such tasks were considered menial and beneath the dignity of an educated person. The hard economic times and rising unemployment appear to have forced a change of attitude, and both the educated and the uneducated alike now vie for these so-called menial jobs.

The relaxation of controls and increasing competition associated with SAP have reduced the "burden and waste of economic management." Nigerian entrepreneurs were often more preoccupied with trying to "beat the system" of regulations and make windfall gains rather than engaging in productive activities during the restrictive controls prevailing in the pre-SAP era. Reference has often been made to the malpractice and the corrupt enrichment of certain individuals that characterized import licensing and foreign exchange rationing in the pre-SAP era.

Some problems have been associated with SAP. These include rising inflation and unemployment and deteriorating social services, and are matters of concern to both analysts and policymakers.

Inflation

The government lifted the wage freeze and adopted expansionary fiscal and monetary policies in 1988 in order to increase aggregate demand and generate employment. The general salary and wage increases of workers in the public and private sectors, the expansionary policies, and the continuing devaluation of the naira appear to have raised inflationary pressure and caused a further erosion of consumer purchasing power without generating significant additional employment. In order to "mop up excess liquidity" from the economy and "dampen inflationary pressure," monetary and fiscal policies were again tightened in 1989. The dilemma is that the apprehension of fueling inflation has now become a major argument against further salary and wage increases. Most analysts agree, however, that there is a need to compensate for the income-eroding effects of inflation, stimulate aggregate demand, and facilitate economic recovery.

Employment

Another problem associated with SAP is rising unemployment. Credible unemployment statistics are difficult to find; however, available estimates indicate that while the labor force increased by 3 percent between 1986 and 1988, the employment level rose by only 1 percent, causing the unemployment problem to assume a "more serious dimension" (*14*). Ojo was quick to add, however, that available data sometimes fail to tell the "true story of unemployment in Nigeria."

The government is making efforts to reduce unemployment. The expansionary monetary and fiscal policies adopted in 1988 were partly aimed at generating employment. However, as Ojo has argued, given a situation in which foreign exchange is crucial in production and consumption but is acutely scarce, expansionary policy would tend to raise the inflationary spiral rather than generate new employment opportunities.

The government also adopted direct measures to increase employment in 1986 by granting 25 million naira to state and local governments, for agricultural projects, and for the vocational training of young school dropouts. In the same year, the government launched the National Directorate of Employment (NDE), whose broad objective was to create employment opportunities and to implement government measures aimed at reducing unemployment. The Directorate estimated that its activities generated 142,100 and 94,400 new jobs in 1987 and 1989, respectively (*2*).

Employment generation has not improved, as thousands of school graduates remain unemployed. The continuing retrenchment of workers in both the public and private sectors has exacerbated the situation. The condition probably explains the decision by the federal government, proposed in the 1991 budget, to establish a 30,000-hectare farm complex in each state of the federation with the primary objective of creating agricultural employment. The mode of operation of the farm complexes is not yet clear, but some analysts view the project as constituting a diversion of scarce resources (especially land and capital) to an inefficient use, in apparent reference to the poor performance of the government in direct agricultural production.

Social Services

Social services have deteriorated in quantity and quality, and the cost of those services has risen significantly over the recent past. The performance of the social services sector, however, was poor even before the adoption of SAP. There was little or no increase in the services provided between 1981 and 1986, according to Ojo. Relatively few new transportation, water supply, health, and educational facilities were provided during the period. There were problems of financial indiscretion, organizational deficiency, inadequate pricing policy, political interference, and inadequate budgetary allocation. Some of these problems have persisted. Yet the most pressing problem in the SAP era appears to be the prohibitive cost of providing services.

The data on components of transport costs culled from the World Bank and detailed in appendix table 5 indicate an escalation of costs in the transport sector and explain the growing dearth of transport vehicles. These services depend on imported inputs. The scarcity of foreign exchange, coupled with the massive devaluation of the naira, resulted in an inadequate supply of chemicals in water treatment plants, drugs in hospitals, books and teaching materials in schools, and spare parts for machines in factories. Prohibitive cost has made the replacement of obsolete and malfunctioning equipment nearly impossible. The removal of subsidies has also contributed to higher transportation costs, higher water rates, higher medical charges, and higher educational levies.

The government's effort to improve social services is evident in the transportation sector. The government set up a Task Force on Urban Mass Transit and Transportation System in 1988 to review the various transportation modes and make recommendations for the development of urban mass transit systems. Following the work of the task force, there have been efforts to improve the different modes of transportation (water, railway, and road).

The most conspicuous effort appears to be the development of road transportation. The federal government acquired and distributed to the states and some educational institutions 939 buses in addition to road construction and renovation. Many of the states have either resuscitated their transport corporations, or set up new agencies to implement road transportation schemes as a result. These efforts appear to have had some impact, although the mass transit problems of major urban centers persist. In addition, questions have been raised concerning the efficiency and longevity of government transport agencies.

Many state governments experimented with transport schemes in the past, although they invariably collapsed after a few years. Will the transport schemes initiated under SAP be different? Most analysts feel that the government probably should concentrate on providing the necessary infrastructure and creating an improved environment for increased private sector investment in the transport sector. In this connection, they feel that the prohibitive import duty (ranging from 50 percent upwards for a saloon car) should be eliminated or drastically reduced in this scheme.

The external sector has been under intense pressure from a deteriorating balance of payments situation and large debt service payments since the adoption of SAP. The balance of payment deficits are largely a product of the deterioration of the current account, which has recorded a deficit each year since the adoption of SAP. Surpluses were recorded in 1984 and 1985. The deficit current account in turn stems from the reduced merchandise trade surpluses and the increased level of deficits in the services and incomes accounts (*2*).

Some national indicators show that Nigeria's external debt burden increased since the adoption of SAP. The average annual debt/export ratio increased from 152 percent from 1983-85 to 408 percent from 1986-88. The debt/GDP ratio increased from 20.2 percent to 114 percent, but the officially controlled debt service ratio (debt service/export ratio) declined from an average 26.6 percent to 22 percent during the same period (*14*).

In sum, the overall effect of SAP on the nonagricultural sectors of the economy has been mixed. The policies have often achieved the desired effects, but have at the same time created unintended and undesirable side effects. These SAP policies have often detracted from, and sometimes overshadowed, the gains.

Summary of Findings

Variable	Situation after SAP compared with situation before SAP
Prices	
General--	Inflation accelerated after SAP, exceeding pre-SAP levels by 1989.
Producer--	Real farmgate prices of cash crops and food crops (with exception of yam and cassava) increased.
Consumer--	Real urban retail prices of domestically produced staples increased.
Production	
Agricultural sector--	Index of agricultural production as a whole rose 5.5 percent after SAP.
Crops subsector--	Index of crop production rose 27.1 percent after SAP; cereal production fell, roots and tubers rose.
Livestock subsector--	Index of livestock production fell 2.2 percent after SAP.
Fisheries subsector--	Index of fish production rose 2.4 percent after SAP.
Forestry subsector--	Index of forestry production rose 6.1 percent after SAP.
Inputs	
Input supplies--	Development authorities had available increased amounts of inputs as a result of SAP.
Farm utilization--	Evidence about trends in farm-level utilization of inputs is very mixed.
Productivity Measures	
Profitability--	Indications are that profitability of farming rose overall as a result of SAP.
Factor productivities--	Crop yields rose; labor productivity also probably rose after SAP.
Employment	
Level--	The level of employment in the rural sector probably rose after SAP.

References

1. Akande, S.O. "The Effect of Structural Adjustment Programme on Agrochemical Products Marketing in Nigeria." NISER Seminar Series, Jun. 1, 1988.

2. Central Bank of Nigeria (CBN). *Annual Report and Statement of Accounts*. CBN, Lagos, 1989 and various issues.

3. _____. *Economic and Financial Review*. Vol. 26, No. 3, Sept. 1988.

4. Dommen, Arthur J. Private communication, 1991.

5. Essien, Efiong. "Nigeria Under Structural Adjustment." Ibadan: Fountain Publications, 1990.

6. Federal Republic of Nigeria. *Structural Adjustment Programme for Nigeria, July 1986-June 1988*. Lagos: Federal Government Printers, 1986.

7. Food and Agriculture Organization of the United Nations (FAO). *Production and Trade Yearbooks*. Various issues, Rome.

8. _____. *Quarterly Bulletin of Statistics*. Various issues, Rome.

9. International Monetary Fund (IMF). *International Financial Statistics*. Various issues, Washington, D.C.

10. Mabbs-Zeno, Carl. *Nigeria: Estimates of Producer and Consumer Subsidy Equivalents: Government Intervention in Agriculture, 1982-87*. SB-803. U.S. Dept. of Agr., Econ. Res. Serv., Apr. 1990.

11. _____. "Report on Nigerian the Structural Adjustment Programme: Effects on the Agricultural Sector." Unpublished. U.S. Dept. of Agr., Econ. Res. Serv., 1991.

12. Nwosu, A.C. "World Economic Recession and the Ascendancy of Protectionism: The Case of the Nigerian Agricultural Sector." *Agriculture and Economic Instability*. Margot Bellamy and Bruce Greenshields, eds. International Association of Agricultural Economists, 1987.

13. _____. "Impact of The Structural Adjustment Programme on Nigerian Agriculture and Rural Life: Imo State Report." Ibadan, Nigeria: NISER, Dec. 1990.

14. Ojo, M.O. "An Appraisal of the Socio-Economic Impact of the Structural Adjustment Programme Policies in Nigeria." *Bullion*, Vol. 13, No. 3-4, CBN, Jul./Dec. 1989.

15. _____. "The Structural Adjustment Programme and Nigeria's Export Crop Subsector." National Conference on the Impact of SAP on Nigerian Agriculture. Ibadan, Nigeria: NISER, Nov. 26-29, 1989.

16. Omoruyi, S.E. "A Review of the Structural Adjustment Pro-gramme, the Foreign Exchange Market and Trade Policies in Nigeria," *Economic and Financial Review*, Vol. 25, No. 4, CBN, Dec. 1987.

17. Oyejide, T. Ademola. "The Effects of Trade and Exchange Rate Policies on Agriculture in Nigeria." Research Report 55. Washington, D.C.: International Food Policy Research Institute, 1986.

18. Richards, Allan. "Oil Booms and Agricultural Development, Nigeria in Comparative Perspective." *State, Oil and Agricultural Development in Nigeria*. Michael J. Watts, ed. University of California, Berkeley: IIS, 1987.

19. Sanusi, J.O. "Genesis of Nigeria's Debt Problems: Problems and Prospects for Debt Conversion." *Economic and Financial Review*, Vol. 26, No. 2, CBN, Jun. 1988.

20. Titilola, S.O. "The Impact of the Structural Adjustment Programme (SAP) on the Agriculture and Rural Economy of Nigeria." *Structural Adjustment Programme in a Developing Economy: The Case of Nigeria*. Phillips and Ndekwu, eds. Ibadan, Nigeria: NISER, 1987.

21. Usoro, Eno J. "Development of the Nigerian Agricultural Sector within the Framework of the Structural Adjustment Programme." *Structural Adjustment Programme in a Developing Economy: The Case of Nigeria*. Phillips and Ndekwu, eds. Ibadan, Nigeria: NISER, 1987.

22. Watts, Michael J. "Agriculture and Oil-Based Accumulation: Stagnation or Transformation." *State, Oil and Agricultural Development in Nigeria*. Michael J. Watts, ed. University of California Berkeley: IIS, 1987.

23. World Bank. "Nigeria: Strategy for Food and Nutrition Security." Jun. 28, 1991.

Suggested Readings

Adesida, M.A., and S.A. Oni. "The Impact of SAP on Agro-Industrial Storage Business: A Case Study from Oyo State." National Conference on the Impact of SAP on Nigerian Agriculture, NISER, Ibadan, Nov. 26-29, 1989.

Aluko-Olokun, Isaac. "An Appraisal of the Second-Tier Foreign Exchange Market (SFEM)." *Structural Adjustment Programme in a Developing Economy: The Case of Nigeria.* Phillips and Ndekwu, eds. Ibadan, Nigeria: NISER, 1987.

Aluko, Sam. "The Burden of Economic Structural Adjustment: The Nigerian Scenario." Lecture given at the 1987 Convocation Ceremony of the University of Ife, Ile-Ife.

Canetti, Elie, and Joshua Greene. "Monetary Growth and Exchange Depreciation as Causes of Inflation in African Countries: An Empirical Analysis." Unpublished manuscript, International Monetary Fund, Jul. 1991.

Evbuomwan, G.O. "The Impact of SAP on the Food Crop Subsector of the Nigerian Agricultural Sector." National Conference on the Impact of SAP on Nigerian Agriculture, NISER, Ibadan, Nov. 26-29, 1989.

Federal Republic of Nigeria, Federal Office of Statistics (FOS). *Annual Abstract of Statistics*. Various issues. Lagos: Federal Government Printer.

Greene, Joshua. "Inflation in African Countries: General Issues and Effect on the Financial Sector." WP/89/86, International Monetary Fund, Oct. 1989.

London, Anselm. "Money, Inflation and Adjustment Policy in Africa: Some Further Evidence." *African Development Review*, Vol. 1 (Jun. 1989), pp. 87-111.

Nwosu, A.C. , M.S. Igben, S.O. Titilola, and A.S. Olomola. *Livestock Development in Nigeria: Problems and Prospects for Ruminant Production, Marketing and Consumption.* Ibadan, Nigeria: NISER, 1987.

Olomola, A.S. "The Structural Adjustment Programme: Prospects and Implications for Rural Development." National Conference on Nigeria's Economic Recovery Strategies, Faculty of Social Sciences, Obafemi Awolowo University, Ile-Ife, 1987.

World Bank. "Nigeria: Agricultural Pricing Policy," West African Region Country Programs, Dept. 1, Nigeria Division, 1984.

_____. "Nigeria: Third Multi-State Agricultural Development Project," West Africa Department, Agriculture Operations Division, Apr. 7, 1989.

_____. "Nigeria: Medium-Term Development Prospects." Oct. 10, 1989.

_____. Project Completion Report Nigeria: Fertilizer Loan. Apr. 24, 1990.

_____. "Project Performance Audit Report Nigeria: Bida and Ekiti-Akoko Agricultural Development Projects." May 17, 1990.

_____. "Project Performance Audit Report Nigeria: Imo Oil Palm Project and Rivers Oil Palm Project." Jun. 13, 1990.

Table 1--Nigeria's foreign exchange, external reserves, and external debt

Year	Foreign exchange earnings			External reserves			External debt	
	Total	Total petroleum	Petroleum percent of total	Total 1/	Foreign exchange	Percent change in foreign exchange	Total	Percent change
	-Million dollars-		Percent	-Million dollars-		Percent	-Million dollars-	Percent
1970	1,248	718	58	202	174	NA	NA	NA
1980	26,294	24,841	94	10,235	9,593	54	8,888	NA
1981	17,241	16,155	94	3,895	3,895	-68	12,039	36
1986	6,784	6,385	94	1,081	1,081	-66	26,931	124
1987	7,559	7,024	93	1,165	1,165	8	31,857	18
1988	6,875	6,267	91	651	651	-44	32,459	2
1989	7,871	7,470	95	1,766	1,765	171	41,525	28

1/ Excluding gold.
NA = Not available.
Source: (2, 9).

Table 2--Nigeria's imports and self-sufficiency ratios (SSR's) in maize, rice, and wheat

Year	Maize				Rice				Wheat			
	Imports		Total domestic supply	Self-sufficiency ratio	Imports		Total domestic supply	Self-sufficiency ratio	Imports		Total domestic supply	Self-sufficiency ratio
	Quantity	Value			Quantity	Value			Quantity	Value		
	1,000 tons	Million dollars	1,000 tons	Percent	1,000 tons	Million dollars	1,000 tons	Percent	1,000 tons	Million dollars	1,000 tons	Percent
1970	9.0	1.2	1,452	99.4	2	0.2	230	99.3	271	22.3	290	606.0
1975	3.0	0.7	1,365	98.8	7	3.9	349	98.1	408	89.5	426	4.2
1979	111.0	38.1	602	81.6	568	254	1,067	46.8	1,038	216.7	1,061	2.2
1980	168.0	60.0	821	79.5	450	245	1,175	61.7	1,176	240.8	1,200	2.0
1981	293.0	63.3	946	69.0	657	408	1,482	55.7	1,517	297.0	1,542	1.6
1982	347.0	102.6	1,000	65.3	539	290	1,370	60.6	1,492	329.8	1,522	2.0
1983	50.0	17.6	1,077	95.4	544	238	1,395	61.0	825	353.4	846	2.5
1984	63.0	18.2	1,259	95.0	365	165	1,230	70.3	1,049	317.9	1,094	4.1
1985	77.0	23.6	1,903	96.0	351	95	1,302	73.0	1,433	367.6	1,663	13.8
1986	50.0	8.8	1,786	97.2	320	80	1,262	74.6	9,516	203.2	9,546	0.3
1987	0.3	0.0	1,523	100.0	400	92	1,077	62.9	1,205	15.2	1,235	2.4
1988	0.3	0.5	1,766	100.0	200	55	871	77.0	0.0	0.0	66	100.0
1989	0.0	0.0	1,613	100.0	200	58	895	77.7	0.0	0.0	86	100.0

Source: (2, 7).

Table 3--Inflation rates, Nigeria

Type	1982	1983	1984	1985	1986	1987	1988	1989
					Percent			
Urban	7.2	20.0	41.2	0.9	10.1	7.0	27.1	47.3
Rural	7.7	23.7	39.4	5.9	4.7	10.7	39.9	40.0
Total	7.9	23.2	39.6	5.7	5.6	10.2	38.3	40.9

Source: Adapted from (2).

Table 4--Monetary and fiscal targets

Monetary and fiscal variables	1987		1988		1989	
	Target	Actual	Target	Actual	Target	Actual
			Percent			
Growth in money supply	11.8	17.1	15.0	43.9	14.7	21.5
Growth in aggregate domestic credit	4.4	12.4	8.1	26.1	9.5	-14.1
Growth in credit to government	1.5	14.4	2.5	30.0	8.3	-33.5
Growth in credit to private sector	7.4	10.1	13.3	21.6	10.7	3.9
Banks' loans and advances	8.0	9.3	12.5	21.0	10.0	14.9
Ratio of budget deficit to GDP	3.5	4.2	3.5	8.0	3.5	6.2

Source: (2).

Table 5--Urban market retail price response to policy changes

Crop	Pre-SAP period	SAP period				Difference between SAP and pre-SAP means
		1987	1988	1989	Mean	
Nominal urban retail prices:	----------Naira/ton----------					Percent
Rice (milled)	2,273	2,358	3,787	6,439	4,195	84.5
Beans	2,080	2,382	3,737	4,581	3,567	71.5
Maize (shelled)	827	838	1,520	2,115	1,491	80.3
Gari	917	800	1,798	2,718	1,772	93.2
Yams	968	856	2,288	2,586	1,910	97.9
Millet	778	595	1,621	1,645	1,287	65.4
Sorghum	755	615	1,611	1,979	1,402	85.7
Peanuts (shelled) 1/	2,045	2,222	2,938	NA	2,580	26.2
Cassava (tubers)	170	309	NA	NA	NA	NA
Real urban retail prices:						
Rice (milled)	450	405	512	591	503	11.8
Beans	412	410	505	421	445	8.1
Maize (shelled)	165	144	206	194	181	9.7
Gari	184	137	243	250	210	14.1
Yams	191	147	309	237	231	20.9
Millet	151	102	219	151	157	3.9
Sorghum	151	106	218	182	169	11.9
Peanuts (shelled) 1/	404	382	397	NA	390	-3.5
Cassava (tubers)	34	53	NA	NA	NA	NA

NA = Not available.
1/ Average computed for 2 years.
Source: Nominal prices derived from (2).

Table 6--Producer price response to policy changes

Crop	Pre-SAP period	SAP period				Difference between SAP and pre-SAP means
		1987	1988	1989	Mean	
Real producer prices of food crops:	----------Naira/ton----------					Percent
Rice (milled)	218	414	540	576	510	133.9
Beans	301	428	566	495	496	64.8
Maize (shelled)	135	109	242	250	200	48.1
Yam	230	163	220	222	202	-12.2
Millet	141	107	188	191	162	14.9
Sorghum	137	149	209	184	181	32.1
Cassava (tuber)	143	73	101	109	94	-34.3
Nominal producer prices of food crops:						
Rice (milled)	1,004	2,313	4,219	6,322	4,285	326.8
Beans	1,302	2,394	4,423	5,420	4,079	213.3
Maize (shelled)	653	611	1,891	2,735	1,746	167.4
Yam	909	910	1,721	2,430	1,687	85.6
Millet	607	597	1,472	2,096	1,388	128.7
Sorghum	570	830	1,630	2,017	1,492	161.8
Cassava (tuber)	642	406	788	1,196	797	24.1
Real producer prices of major cash crops:						
Cocoa	448	1,335	1,417	686	1,146	155.8
Cotton lint	175	712	580	512	601	243.4
Peanuts (shelled) 1/	164	369	290	587	415	153.0
Palm kernels	83	151	129	229	170	104.8
Palm oil (special)	150	214	193	120	176	17.3
Rubber (100% dry lump, top quality)	185	178	193	183	185	0.0
Benniseed	75	409	258	468	378	404.0
Nominal producer prices of major cash crops:						
Cocoa	2,200	7,500	11,000	7,500	8,667	294.0
Cotton lint	850	4,000	4,500	5,600	4,700	452.9
Peanuts (shelled) 1/	800	2,075	2,250	6,421	3,582	347.8
Palm kernels	400	850	1,000	2,500	1,450	262.5
Palm oil (special)	733	1,200	1,500	1,310	1,337	82.4
Rubber (100% dry lump, top quality)	900	1,000	1,500	2,000	1,500	66.7
Benniseed	360	2,295	2,000	5,120	3,138	771.7

1/ Average computed for 2 years.

Source: Nominal prices derived from (2).

Table 7--Ratio of producer price to world price

Crop	Pre-SAP period	SAP period				Difference between SAP and pre-SAP ratios
		1987	1988	1989	Mean	
	Ratio					Percent
Food crops:						
Rice (milled)	3.55	2.35	2.58	2.59	2.51	-29.3
Beans	3.15	1.44	1.47	0.88	1.26	-60.0
Maize (shelled)	4.42	0.87	3.30	3.22	2.46	-44.3
Millet	4.89	1.98	2.78	2.56	2.44	-50.1
Sorghum	4.65	2.75	3.08	2.46	2.76	-40.6
Cassava (tuber)	7.57	0.98	1.71	2.11	1.60	-78.9
Cash crops:						
Cocoa	0.66	0.90	1.29	0.79	0.99	50.0
Cotton lint	0.42	0.59	0.55	0.43	0.52	23.8
Peanuts (shelled)	1.61	1.75	1.44	2.62	1.94	20.5
Palm oil	1.13	0.85	0.64	0.49	0.66	-41.6
Rubber (100% dry lump, top quality)	0.74	0.23	0.22	0.25	0.23	-68.9

Source: Producer prices as indicated in table 4; world prices from (8).

Table 8--Index of agricultural production

Commodity	1984	1985	1986	1987	1988	1989	Average: Pre-SAP (1984-86)	Average: SAP (1987-89)	Difference between SAP and Pre-SAP mean indices
	Index (1975 = 100)								Percent
Crops	88.9	97.1	104.6	115.9	122.4	131.4	96.9	123.2	27.1
Livestock	102.4	106.8	110.7	106.9	104.1	101.9	106.6	104.3	-2.2
Fish	73.6	51.8	60.7	63.1	59.9	67.6	62.0	63.5	2.4
Forestry	107.4	110.6	110.7	113.5	115.8	119.6	109.6	116.3	6.1
Aggregate	91.4	95.8	102.1	100.1	101.1	104.0	96.4	101.7	5.5

Source: (2, 7, 14).

Table 9--Contribution of agriculture to gross domestic product at 1984 factor cost

Year	Crops: Total value	Crops: Share of GDP	Livestock: Total value	Livestock: Share of GDP	Forestry: Total value	Forestry: Share of GDP	Fishing: Total value	Fishing: Share in GDP	Aggregate: Total value	Aggregate: Share in GDP
	Billion naira	Percent	Billion naira	Percent	Billion naira	Percent	Billion naira	Percent	Billion naira	Percent
1985	17.52	23.53	5.86	7.87	2.29	3.08	1.34	1.80	27.01	36.28
1986	23.35	29.97	4.66	5.98	1.43	1.84	1.77	2.27	31.21	40.06
Average 1985-86	20.44	26.75	5.26	6.93	1.86	2.46	1.56	2.04	29.11	38.17
1987	23.92	30.18	4.71	5.94	1.44	1.82	1.79	2.26	31.86	40.20
1988	25.24	30.58	4.83	5.85	1.47	1.78	1.33	1.61	32.87	39.82
1989	26.40	30.76	5.09	5.93	1.51	1.76	1.36	1.58	34.36	40.03
Average 1987-89	25.19	30.51	4.88	5.91	1.47	1.79	1.49	1.82	33.03	40.02

Source: (2).

Table 10--Performance indicators for specific crops

Indicator/crop	Base year 1984-86	1987	1988	1989	Average 1987-89
Production:			1,000 tons		
Food crops					
Maize (shelled)	1,571	1,523	1,766	1,613	1,634
Rice (milled)	601	677	671	695	681
Millet	3,321	3,156	3,445	3,457	3,353
Sorghum	4,405	4,086	3,915	3,888	3,963
Wheat	45	66	86	129	94
All cereals	10,209	9,771	10,144	10,053	9,989
Yam	10,999	13,874	14,282	14,542	14,233
Cassava (tuber)	9,173	8,203	8,772	8,802	8,592
All roots and tubers	21,182	22,826	23,838	25,141	23,938
Cash crops					
Cocoa	118	128	195	208	177
Rubber (100% dry lump, top quality)	82	63	68	90	74
Palm oil (special)	659	705	725	735	722
Palm kernels	352	300	270	300	290
Seed cotton	60	90	187	198	158
Peanuts (shelled)	658	687	815	1,000	834
Change in production:			Growth rate over previous year		
			Percent		
Food crops					
Maize (shelled)		-3.1	16.0	-8.7	1.4
Rice		12.6	-0.9	3.6	5.1
Millet		-5.0	9.2	0.3	1.5
Sorghum		-7.2	-4.2	-0.7	-4.0
Wheat		46.7	30.3	50.0	42.3
All cereals		-4.3	3.8	-0.9	-0.5
Yam		26.1	2.9	1.8	10.3
Cassava (tuber)		-10.6	6.9	0.3	2.7
All roots and tubers		7.8	4.4	5.5	5.9
Cash crops					
Cocoa		8.5	52.3	6.7	22.5
Rubber (100% dry lump, top quality)		-23.2	7.9	32.4	5.7
Palm oil (special)		7.0	2.8	1.4	3.7
Palm kernels		-14.7	-10.0	11.1	-4.5
Seed cotton		50.0	107.8	5.9	54.6
Peanuts (shelled)		4.4	18.6	22.7	15.2
Change in production/change in price:			Percent		
Maize (shelled)		0.2	0.1	-2.6	-0.8
Rice (husked)		0.1	-0.0	0.5	0.2
Millet		-0.2	0.1	0.2	0.0
Sorghum		-0.8	-0.1	-0.1	-0.4
Yam		-0.9	0.1	2.0	0.4
Cassava (tuber)		0.2	0.2	1.5	0.6
Seed cotton		0.3	5.8	0.5	2.1
Peanuts (shelled)		0.0	1.7	3.3	1.7

Source: Production figures are means of data from (2) and (7).

Table 11--Change in the area and yields of selected crops

Area/yield/crops	Base year 1984-86	1987	1988	1989	Average 1987-89
Area cultivated:			1,000 hectares		
Rice	580	630	635	640	635
Maize	1,992	2,000	2,200	2,000	2,067
Sorghum	4,967	4,300	4,400	4,400	4,367
Millet	4,600	3,100	3,500	3,500	3,367
All cereals	12,148	10,045	10,775	10,590	10,470
Cassava	1,267	1,500	1,600	1,700	1,600
Yam	1,633	1,750	1,800	1,885	1,812
All roots and tubers	3,110	3,250	3,400	3,585	3,412
Peanuts	722	874	950	1,000	941
Seed cotton	303	320	340	390	350
Yields:			Tons/hectare		
Rice	1.04	1.07	1.06	1.09	1.07
Maize	0.79	0.76	0.80	0.81	0.79
Sorghum	0.91	0.95	0.89	0.88	0.91
Millet	0.75	1.02	0.98	0.99	1.00
Cassava	7.23	5.47	5.48	5.77	5.57
Yam	6.73	7.93	7.94	7.71	7.86
Peanuts	0.90	0.79	0.86	1.00	0.88
Seed cotton	0.20	0.28	0.55	0.51	0.45
Change in area cultivated:			Percent		
Rice		8.6	0.8	-0.8	2.9
Maize		0.4	10.0	-9.1	4.6
Sorghum		-13.4	2.3	0.0	-3.7
Millet		-32.6	12.9	0.0	-6.6
All cereals		-17.3	7.3	-1.7	-3.9
Cassava		18.4	6.7	6.3	10.5
Yam		7.2	2.9	4.7	4.9
All roots and tubers		4.5	4.6	5.4	4.8
Peanuts		21.1	8.7	5.3	11.7
Seed cotton		5.6	6.3	14.7	8.9
Change in yields:			Percent		
Rice		2.9	-0.9	2.8	1.6
Maize		-3.8	5.3	1.3	0.9
Sorghum		4.4	-6.3	-1.1	-1.0
Millet		36.0	-3.9	1.0	11.0
Cassava		-24.3	0.2	5.3	-6.3
Yam		17.8	0.1	-2.9	5.0
Peanuts		-12.2	8.9	16.3	4.3
Seed cotton		40.0	96.4	-7.3	43.0

Source: Production figures are means of data from (2) and (7).

Table 12--Annual rainfall

Rainfall						Mean rainfall		Difference in mean rainfall
1984	1985	1986	1987	1988	1989	1984-86	1987-89	
Millimeters								Percent
1,189	1,327	1,187	966	1,426	1,330	1,234	1,241	0.57

Source: (2).

Table 13--Manufactured fertilizer supply

Items	Unit	1984-1986 average	1987-1989 average	Percent change
Domestic production	1,000 m.t.	5.0	222.0	4,340.0
Imports	1,000 m.t.	289.3	216.0	-25.3
SSR	Percent	1.7	48.0	2,723.5
Exports	1,000 m.t.	NA	118.3	NA
Net supply	1,000 m.t.	267.7	319.7	19.4

NA = Not available.
m.t. = Metric tons.
Source: Derived from data in (7).

Table 14--Number of tractors in use

Item	1984-1986 average	1987-1989 average	Percent change
	Thousands		
Tractors imported	1,115.3	963.6	-13.6
Tractors in use	10,266.6	11,033.3	7.5

Source: Derived from data in (7).

Table 15--Financial allocation to agriculture

Source of allocation	1984	1985	1986	1987	1988	1989	Average Pre-SAP 1984-86	Average SAP 1987-89	Percent change
	Million naira								Percent
Banks:									
Commercial banks loans and advances	1,971	1,230	15,700	17,500	3,068	3,399	6,300	7,982	26.8
Merchant banks loans and advances	153	177	201	323	513	8,419	177	3,085	164.0
Nigerian Agriculture and Cooperative Bank	287	319	306	319	430	476	304	408	34.4
Insurance companies	0	2	0	0	0	0	1	0	-85.0
Agricultural projects:									
ADP's	63	149	217	442	392	294	143	376	163.0
RBDA's	318	84	79	88	123	148	160	120	-25.0
DFRRI	NA	NA	500	400	500	300	167	400	140.0
Federal Government capital expenditure	129	135	236	443	660	1,733	167	945	468.0
Foreign, private, capital investment	1	3	2	NA	NA	NA	2	NA	NA
Total	2,921	2,098	17,242	19,515	5,686	14,769	7,421	13,316	886.2

NA = Not available.
Source: (3) for data on foreign investment in Nigeria; (2) for all other data.

Table 16--Some inputs supplied by ADP's and RBDA's

Input	Unit	1984	1985	1986	1987	1988	1989	Average 1/ Pre-SAP 1/ (1984-86)	Average 1/ SAP (1987-89)	Average 1/ Percent change
Fertilizers	1,000 m.t.	375.1	434.5	580.0	546.9	772.2	335.7	463.2	551.6	19.1
Seed multiplication	1,000 ha.	NA	2.2	5.1	3.5	4.3	7.1	3.7	5.0	34.9
Land clearing	1,000 ha.	67.9	60.3	52.0	72.7	72.0	100.0	60.1	81.5	35.8
Tractor hire	1,000 ha.	NA	NA	7.6	2.7	0.1	NA	NA	NA	NA
Herbicides	1,000 ltr.	NA	NA	211.9	86.0	73.1	32.1	70.6	63.7	-9.8
Pesticides/fungicides	1,000 ltr.	NA	NA	31.1	30.9	35.4	11.3	10.4	25.9	149.6

NA = Not available.
m.t. = Metric tons.
ha. = Hectares.
ltr. = Litres.
1/ Averages for herbicides and fungicides were derived using data for 1 year only.
Source: Derived from data in (2).

Table 17--Quantities of inputs used per hectare of farm land in Imo State

Input	Unit	Quantity 1984	1985	1986	1987	1988	1989	Average quantity Pre-SAP (1984-86	SAP (1987-89)	Percent change
Rented land	ha.	0.2	0.4	0.5	0.3	0.2	0.2	0.4	0.3	-27.0
Hired labor	man-day	145.2	108.0	206.0	233.0	172.4	140.0	153.1	181.8	18.7
Gramazone	ltr.	4.3	8.8	9.3	2.0	1.0	0.6	7.5	1.2	-84.0
Fertilizer	kg.	13.8	11.2	11.3	7.3	5.1	7.1	12.1	6.5	-46.2
Tractor hire	ha.	0.1	0.2	0.3	0.3	0.2	0.2	0.2	0.3	30.0

Source: (13).
ha. = Hectares.
ltr. = Litres.

Table 18--Farm input prices, nominal and real

Input	Unit	Unit price						Average unit price		Percent change	Annual percent change (1986-89)
		1984	1985	1986	1987	1988	1989	Pre-SAP (1984-86)	SAP (1987-89)		
		Naira								Percent	
Fertilizer	25-kg bag	15.5 (3.4)	16.3 (3.4)	14.4 (2.8)	15.9 (2.9)	18.5 (2.4)	24.0 (2.0)	15.4 (3.2)	19.5 (2.4)	26.6 (-25)	18.8 (-10.1)
Land rental	hectare	83.0 (18.2)	45.0 (9.3)	41.0 (8.1)	77.0 (13.9)	102.0 (13)	89.0 (7.4)	56.3 (11.9)	89.3 (11.4)	58.6 (-4.2)	35.8 (7.3)
Tractor hire	hectare	67.0 (14.7)	69.0 (14)	68.0 (13.5)	100.0 (18.1)	112.0 (14.3)	126.0 (10.5)	68.0 (14.2)	112.7 (14.3)	66.2 (0.7)	23.9 (-4.5)
Wage rate	man-day	9.9 (2.2)	9.2 (1.9)	11.3 (2.2)	11.7 (2.1)	11.9 (1.5)	12.5 (1.0)	10.1 (2.1)	12.0 (1.5)	18.8 (-28.6)	3.4 (-22.2)
Gramazone	litre	12.5 (2.7)	14.0 (2.9)	15.0 (3.0)	23.8 (4.3)	35.8 (4.6)	45.0 (3.8)	13.8 (2.9)	34.9 (4.2)	152.9 (94.8)	44.9 (11.0)

kg = Kilogram.
Note: Real prices in parentheses. Rural price index used as deflator.
Source: Table 17.

Table 19--Fertilizer subsidy rate and cost

Year	Subsidy cost	Subsidy rate	Households using fertilizer in ADP
	Million naira	Percent	
1984	202	67.5	56.8
1985	118	37.5	73.0
1986	49	29.2	68.0
1989	90	85.0	NA
1990	2,000	90.0	NA

NA = Not available.
Source: 1984-1986 data from unpublished World Bank material; 1989-90 data from (11).

Table 20--Whole farm gross margin analysis, Imo state

Period	Gross value of crop output per household	Total expenditure on variable input per household	Gross return per household	Average farm size per household	Gross return per hectare 1/
	Naira			Hectare	Naira
(Current factor cost)					
Pre-SAP	5,759.0	432.0	5,327.0	0.23	23,161
SAP	9,997.0	644.0	9,353.0	0.20	46,765
Percent change	73.6	49.1	75.6	-13.00	102
(1985 factor cost)					
Pre-SAP	5,700.0	427.0	5,260.0	0.23	22,871
SAP	5,965.0	384.0	5,581.0	0.20	27,903
Percent change	4.6	-10.1	6.1	-13.10	22

1/ Does not impute cost to family labor.
Source: Table 18.

Table 21--Average policy transfers to producers in the pre-SAP and SAP periods 1/

Policies	Pre-SAP (1984-86) Mean value	Pre-SAP (1984-86) Nature of transfers	SAP (1987-89) Mean value	SAP (1987-89) Nature of transfers	Percent change over pre-SAP mean 2/
	Million 1985 naira				Percent
Pesticide subsidy	5.0	subsidy	4.6	subsidy	-8.0
Credit subsidy	7.7	subsidy	8.0	subsidy	3.9
Fertilizer subsidy	60.3	subsidy	153.3	subsidy	154.1
Marketing boards	23.7	subsidy	0.0		-100.0
Tariffs	94.3	subsidy	55.0	subsidy	-41.7
Foreign exchange controls	-1,311.3	tax	-298.3	tax	-77.3
Other non-tariff border controls	1,006.3	subsidy	258.0	subsidy	-74.4
Total transfers	-113.7	tax	180.3	subsidy	-258.6
Total producer revenues	2,648.7	-	4,182.0	-	57.9
Transfers percent of revenues	-3.3	-	6.9	-	-309.1

1/ Covers only the producers of wheat, white corn, rice, sugar, cotton, and cocoa.
2/ In tables 21, 22, 25, 26, and appendix tables 3 and 4, a negative sign before the value of transfers indicates a tax; a negative sign before the "percent change" indicates a decline in either a tax or subsidy.
Source: Adapted from data in appendix table 1.

Table 22--Change in producer subsidy equivalents (measured in 1985 factor cost) for selected crops

Crop/period	Production	Producer price	Value to producer	Total policy transfers	PSE (per unit value)	PSE (per unit quantity)	PSE (per unit quantity)
	1,000 tons	Naira/ton	------Million naira-----		Percent	Naira/ton	$/ton
Wheat:							
Pre-SAP	17.0	525.0	9.9	-1.3	-16.5	-27.8	-76.9
SAP	47.0	2,900.0	173.6	113.5	66.3	2,121.8	382.1
Percent change	177.0	452.4	1,636.0	-8,830.8	-501.8	-7,721.4	-596.6
Rice (milled):							
Pre-SAP	654.0	1,004.0	658.0	650.0	98.0	995.0	1,005.0
SAP	568.0	2,194.0	1,278.9	178.7	21.5	330.1	85.4
Percent change	-13.1	118.5	94.4	-72.5	-78.1	-66.8	-94.5
Sugar:							
Pre-SAP	55.0	130.0	7.0	-15.4	-231.7	-274.6	-299.6
SAP	53.0	1,492.0	74.8	23.8	33.1	456.4	83.4
Percent change	-3.6	1,047.7	968.6	-254.6	-114.3	-266.2	-127.8
Cotton lint:							
Pre-SAP	18.0	2,127.0	48.0	-55.8	-139.4	-2,918.4	-3,016.2
SAP	27.3	11,750.0	317.0	205.7	64.4	7,671.0	1,458.4
Percent change	51.9	452.4	560.4	-468.6	-146.2	-362.9	-148.4
Maize (white):							
Pre-SAP	1,933.0	859.0	1,649.0	38.2	2.4	19.7	20.4
SAP	2,000.0	1,745.7	3,538.9	130.9	4.9	64.8	12.9
Percent change	3.5	103.2	114.6	243.0	105.9	229.4	-36.6
Cocoa:							
Pre-SAP	128.0	2,113.0	270.0	-741.1	-339.9	-5,639.0	-6,366.0
SAP	197.0	9,833.0	2,344.4	-389.6	-13.5	-1,533.3	-262.7
Percent change	53.9	365.4	768.3	-47.4	-96.0	-72.8	-95.9

Source: Derived from appendix table 3.

Table 23--Per capita consumption of major crops

Crop	1975-79	1980-85	1986-88	Percent change over 1975-79	Percent change over 1980-86
	Kilograms			Percent	
Cereals	103.9	111.6	114.4	10.1	2.5
Roots and tubers	261.0	241.5	226.8	-13.1	-6.1
Pulses	6.5	5.2	9.0	38.5	73.1
Vegetable oils	10.6	10.0	8.5	-19.8	-15.1
Fruits	27.1	26.5	28.1	3.7	6.0
Sugar	5.2	7.9	5.1	-1.9	-35.4

Source: Computed from FAO database.

Table 24--Consumption of calories, protein, and fat

Year	Calorie consumption/person/day				Protein consumption/person/day		Fat consumption/person/day	
	Quantity	Percent change over preceding period	Contribution of cereals	Contribution of roots and tubers	Quantity	Percent change over preceding period	Quantity	Percent change over preceding period
	Calories	Percent			Gram	Percent	Gram	Percent
1975-79	2,168	-	38.6	30.0	48.4	-	48.9	-
1980-85	2,171	0.1	41.6	27.8	48.5	0.2	46.4	-5.1
1986-88	2,105	-3.0	44.4	26.6	48.0	-1.0	42.5	-8.4

Source: Table 23.

Table 25--Summary of policy transfers to consumers 1/

Policies	Pre-SAP (1984-86)		SAP (1987-89)		
	Mean value	Nature of transfers	Mean value	Nature of transfers	Percent change over pre-SAP mean
	Million 1985 naira				Percent
Tariffs	-175.0	tax	-493.7	tax	182.1
Foreign exchange controls	1,765.0	subsidy	227.2	subsidy	-87.1
Other non-tariff border controls	1,474.0	subsidy	-169.0	tax	-88.5
Total transfers	115.7	subsidy	-435.0	tax	-476.0
Total consumer costs	2,514.0	-	2,591.0	-	3.1
Transfers percent of costs	5.3	subsidy	-16.5	tax	-411.3

1/ Consumers of wheat, yellow corn, rice, sugar, and cotton lint.
Source: Derived from data in appendix table 4.

Table 26--Change in consumer subsidy equivalents for selected crops (measured in 1985 factor cost)

Crop/period	Level of consumption	Wholesale/retail price	Cost to consumers	Total policy transfers	CSE (per unit value)	CSE (per unit quantity)	CSE (per unit quantity)
	--1,000 tons--	--Naira/ton--	---------Million naira-------		--Percent--	--Naira/ton--	--$/ton--
Wheat:							
Pre-SAP	1,401.0	160.0	219.0	599.5	258.2	399.3	453.8
SAP	315.3	951.3	301.5	-529.6	-182.4	1,718.0	-319.3
Percent change	-77.5	494.6	37.7	-188.3	-170.7	-530.3	-170.4
Rice (milled):							
Pre-SAP	922.0	2,273.0	2,113.0	-898.3	-41.5	-959.1	1,006.9
SAP	689.7	4,313.7	2,703.4	-43.7	-2.9	-40.6	19.9
Percent change	-25.2	89.8	27.9	-95.1	-93.0	-95.8	-102.0
Sugar:							
Pre-SAP	541.0	144.0	80.0	176.9	253.4	325.5	336.2
SAP	540.7	1,491.6	756.4	135.2	14.5	266.4	45.3
Percent change	-0.1	935.9	845.4	-23.6	-94.3	-18.2	-86.5
Cotton lint:							
Pre-SAP	62.0	1,745.0	112.0	225.3	221.3	3,668.5	3,927.8
SAP	40.5	13,613.0	477.2	-260.7	-53.0	5,514.5	1,145.5
Percent change	-34.7	680.1	326.1	-215.7	-124.0	-250.3	-129.2
Maize (white):							
Pre-SAP	83.3	122.6	10.0	26.3	246.0	296.0	330.3

Source: Derived from data in appendix table 4.

Table 27--Exports of major crops

Period	Cocoa		Groundnuts		Cotton		Rubber		Benniseed		Palm kernels		Palm oils	
	Quantity	Growth rate	Quantity	Growth rate	Quantity	Growth rate	Quantity	Growth rate	Quantity	Growth rate	Quantity	Growth rate	Quantity	Growth rate
	1,000 mt	Percent	1,000 mt	Percent	1,000 mt	Percent	1,000 mt	Percent	1,000 mt	Percent	1,000 mt	Percent	1,000 mt	Percent
1955-59	579	-	2,192	-	186	-	207	-	86	-	2,196	-	902	-
1960-64	920	58.9	2,557	16.7	137	-26.3	312	50.7	107	24.5	2,022	-7.9	738	-18.2
1965-69	1,087	18.2	2,835	10.9	91	-33.6	279	-10.6	80	-25.2	1,333	-34.1	326	-55.8
1970-74	1,120	3.1	764	-73.1	79	-13.2	264	-5.4	27	-66.3	964	-27.7	30	-90.8
1975-79	971	-13.3	2	-99.7	15	-81.0	188	-28.8	0	-100.0	737	-23.5	1	-96.7
1980-84	761	-21.6	0	-100.0	0	-100.0	135	-28.2	0	-	459	-37.7	0	-100.0
1985-89	667	-12.4	0	-	0	-	39	-71.1	0	-	369	-19.6	0	-

Source: (2, 7).

Table 28--Agricultural export earnings

Commodity	1980	1981	1982	1983	1984	1985	1986	1987	1988
Current factor cost				Million naira					
Cocoa	311	143	150	226	183	182	371	1,498	2,637
Palm kernels	14	18	11	17	8	6	8	30	103
Natural rubber	14	18	16	15	17	4	29	61	290
Peanuts	0	0	0	1	0	0	0	0	0
Cocoa butter	20	75	16	29	24	47	45	54	59
Total	359	254	193	288	232	239	453	1,643	3,089
Total in million dollars	657	414	287	398	304	268	336	410	686
1975 factor cost				Million naira					
Cocoa	151	59	56	69	40	38	73	267	339
Palm kernels	7	7	4	5	2	1	2	5	13
Natural rubber	7	7	6	5	4	1	6	11	37
Peanuts	0	0	0	0	0	0	0	0	0
Cocoa butter	10	31	6	9	5	10	9	10	8
Total	175	105	72	88	51	49	89	292	398
Total in million dollars	320	170	107	121	66	55	66	73	88

Note: Totals may not add due to rounding.
Source: Adapted from unpublished World Bank material, October 1989.

Table 29--Contribution of agriculture to foreign exchange earnings

Year	Petroleum		Agriculture			Others	
	Amount	Share of total export earnings	Amount	Share of total export earnings	Share of non-oil export earnings	Amount	Share of total export earnings
	Million naira	Percent	Million naira	Percent		Million naira	Percent
1984	8,841	97.3	232	2.5	93.5	16	0.2
1985	11,224	95.8	239	2	48.1	258	2.2
1986	8,369	93.8	453	5.1	81.9	100	1.1
1984-86 average	9,478	95.6	308	3.2	71.1	125	1.2
1987	28,209	92.9	1,643	5.4	76.3	510	1.7
1988	29,293	88.4	3,089	9.3	80.3	757	2.3
1987-88 average	28,751	90.7	2,366	7.3	78.9	634	2.0

Source: (2, 9).

Appendix table 1--Proportion of total loans and advances of commercial and merchant banks allocated to agriculture

Year	Commercial banks			Merchant banks		
	Prescribed percentage	Average performance	Deviation from target	Prescribed percentage	Average performance	Deviation from target
	Percent					
1985	12.0	10.0	-2.0	6.0	5.7	-0.3
1986	15.0	11.8	-3.2	8.0	7.2	-0.8
1987	15.0	12.9	-2.1	10.0	7.7	-2.3
1988	15.0	15.3	0.3	10.0	11.5	1.5
1989	15.0	15.3	0.3	10.0	14.3	4.3

Source: (2).

Appendix table 2--Nigerian agricultural and cooperative bank sectoral allocation of outstanding loans and investments

Sectors	1985		1986		1987		1988		1989 1/	
	Amount	Percent of total	Amount	Percent of total	Amount	Percent of total	Amount	Percent of total	Amount	Percent of total
	Million naira	Percent	Million naira	Percent	Million naira	Percent	Million naira	Percent	Million naira	Percent
(A) Loans and advances	318.7	100.0	306.4	100.0	319.0	100.0	430.0	100.0	476.3	100.0
Animal husbandry	75.9	23.8	16.2	5.3	16.1	5.0	24.3	5.7	25.3	5.3
Food crops	135.1	42.4	110.2	36.0	177.4	55.6	201.5	46.9	206.5	43.4
Other crops	46.9	14.7	51.8	16.9	39.1	12.3	82.2	19.1	83.6	17.5
Fishery	15.0	4.7	15.1	4.9	15.4	4.8	18.6	4.3	21.4	4.5
Poultry	27.0	8.5	32.0	10.4	34.6	10.9	40.2	9.3	40.2	8.5
Others	18.8	5.9	81.1	26.5	36.4	11.4	63.3	14.7	99.0	20.8
(B) Investments	1.0	100.0	1.0	100.0	1.0	100.0	1.0	100.0	NA	NA
Other crops	0.7	70.0	0.7	70.0	0.6	60.0	0.6	60.0	NA	NA
Fishery	0.3	30.0	0.3	30.0	0.4	40.0	0.4	40.0	NA	NA
Total (A) and (B)	319.7	-	307.4	-	320.0	-	431.1	-	476.3	-

1/ Totals cover January through June 1989.
NA = Not available.
Source: Appendix table 1.

Appendix table 3--Producer subsidy equivalents for selected crops at 1985 factor cost

Commodity/period	Production 1/	Producer price	Value to producer	Total policy transfers	PSE (per unit value)	PSE (per unit quantity)	PSE (per unit quantity)
	1,000 ton	Naira/ton	-----Million naira-----		Percent	Naira/ton	$/ton
Wheat:							
Pre-SAP (1984-86) mean	17	525	10	-1	-16.5	-27.8	-76.9
1987	30	1,300	39	25	64.5	839.3	209.4
1988	50	3,200	160	118	73.7	2,357.1	525.9
1989	60	4,200	252	154	61.1	2,565.8	348.7
SAP (1987-89) mean	47	2,900	150	99	66.4	1,920.6	361.3
Percent change over 1984-86	177	452	1,403	7,715	502.4	6,998.7	569.6
Rice (milled):							
Pre-SAP (1984-86) mean	654	1,004	658	650	98.0	995.0	1,005.0
1987	552	1,311	724	262	36.2	474.6	118.5
1988	554	2,110	1,169	450	38.5	811.7	181.1
1989	559	3,161	1,893	-149	-7.9	-249.1	-33.9
SAP (1987-89) mean	555	2,194	1,262	179	22.3	345.7	88.6
Percent change over 1984-86	-15	119	92	-71	-77.2	-65.3	-91.2
Sugar:							
Pre-SAP (1984-86) mean	55	130	7	15	-231.7	-274.6	-299.6
1987	59	726	43	17	40.5	293.8	73.3
1988	50	1,224	61	16	26.7	326.6	72.9
1989	50	2,525	126	39	30.8	778.1	105.7
SAP (1987-89) mean	53	1,492	77	24	32.7	466.1	84.0
Percent change over 1984-86	4	1,048	996	257	114.1	269.8	128.0
Cotton lint:							
Pre-SAP (1984-86) mean	18	2,127	48	56	-139.4	2,918.4	3,016.2
1987	27	10,000	270	176	65.4	6,536.6	1,631.5
1988	29	11,250	324	160	49.4	5,554.1	1,239.1
1989	26	14,000	358	287	80.1	11,212.2	1,523.7
SAP (1987-89) mean	27	11,750	317	208	64.9	7,767.6	1,464.8
Percent change over 1984-86	52	452	561	472	146.5	366.2	148.6
Maize (white):							
Pre-SAP (1984-86) mean	1,933	859	1,649	38	2.4	19.7	20.4
1987	1,900	611	1,161	97	8.4	51.3	12.8
1988	2,200	1,891	4,160	154	3.7	69.8	15.6
1989	19,000	2,735	5,197	138	2.7	72.6	9.9
SAP (1987-89) mean	2,000	1,746	3,506	130	4.9	64.6	12.8
Percent change over 1984-86	4	103	113	240	105.9	228.4	37.1
Cocoa:							
Pre-SAP (1984-86) mean	128	2,113	270	741	-399.9	5,639.0	6,366.0
1987	105	7,500	788	67	8.5	640.0	160.0
1988	230	11,000	2,530	456	-18.0	1,984.0	-443.0
1989	256	11,000	2,816	517	-18.4	2,020.0	-274.0
SAP (1987-89) mean	197	9,833	2,045	302	-9.3	-1,121.3	-185.7
Percent change over 1984-86	54	365	657	59	-97.7	80.1	97.1

Source: Derived from (10) and (11).

Appendix table 4--Consumer subsidy equivalents (CSE's) for selected crops at 1985 factor cost

Commodity/period	Level of consumption	Retail (wholesale) price 1/	Cost to consumers	Total policy transfers	CSE (per unit value)	CSE (per unit quantity)	CSE (per unit quantity)
	1,000 ton	Naira/ton	-----Million naira-----		Percent	Naira/ton	$/ton
Wheat:							
Pre-SAP (1984-86) mean	1,401.0	160.0	219.0	599.5	258.2	-399.3	453.8
1987	362.0	573.0	207.0	-277.4	-133.8	-766.4	-191.3
1988	259.0	793.0	205.0	-568.4	-276.9	-2,194.5	-489.6
1989	325.0	1,488.0	484.0	-780.1	-161.3	-2,400.4	-326.2
SAP (1987-89) mean	315.3	951.3	298.7	-542.0	-190.7	-1,787.1	-335.7
Percent change over 1984-86	-77.5	494.6	36.4	-190.4	173.9	-547.6	-174.0
Rice (milled):							
Pre-SAP (1984-86) mean	922.0	2,273.0	2,113.0	-898.3	-41.5	-959.1	1,006.9
1987	899.0	2,400.0	2,158.0	-151.5	-7.0	-168.6	-42.1
1988	567.0	4,219.0	2,392.0	-143.7	-6.0	253.4	-56.6
1989	603.0	6,322.0	3,812.0	211.7	5.6	351.0	47.7
SAP (1987-89) mean	689.7	4,313.7	2,787.3	-27.8	-2.5	145.3	-17.0
Percent change over 1984-86	-25.2	89.8	31.9	96.9	94.0	115.1	98.3
Sugar:							
Pre-SAP (1984-86) mean	541.0	144.0	80.0	176.9	253.4	325.5	336.2
1987	597.0	726.0	433.0	-15.2	-3.5	-25.5	-6.4
1988	525.0	1,224.0	642.0	188.4	29.3	358.8	80.1
1989	500.0	2,525.0	1,263.0	259.0	20.5	518.0	70.4
SAP (1987-89) mean	540.7	1,491.7	779.3	144.1	15.4	283.8	48.0
Percent change over 1984-86	-0.1	935.9	874.1	-18.5	-93.9	-12.8	-85.7
Cotton lint:							
Pre-SAP (1984-86) mean	62.0	1,745.0	112.0	225.3	221.3	3,668.5	3,927.8
1987	67.0	7,645.0	512.0	-242.5	-66.9	-5,111.4	-1,277.9
1988	28.8	10,801.0	311.0	-103.1	-33.1	-3,579.3	-799.1
1989	25.6	22,393.0	573.0	-223.8	-39.0	-8,742.4	-1,188.2
SAP (1987-89) mean	40.5	13,613.0	465.3	-189.8	-46.3	-5,811.0	-1,088.4
Percent change over 1984-86	-34.7	680.1	315.4	-184.2	-120.9	-258.4	-127.7
Maize (yellow)							
Pre-SAP (1984-86) mean	83.3	122.6	10.6	29.7	266.1	316.0	368.5

1/Wholesale price applies to corn (yellow), cotton lint, and wheat.
Source: (10) and (11).

Appendix table 5--Changes in components of transportation costs, 1985 and 1989

Transport	1985	1989	Percent increase
	------Naira-----		Percent
Light truck tire	50	560	1,020
Tire tube	15	70	367
Crankshaft	800	3,500	338
Heavy truck tire	300	2,000	567
Heavy truck	8,000	250,000	3,025

Source: (23).

Glossary

ACGSF	Agricultural Credit Guarantee Scheme Fund
ADP	Agricultural Development Project
BPD	Barrels per Day
CBN	Central Bank of Nigeria
CSE	Consumer Subsidy Equivalent
DFRRI	Directorate of Food, Roads and Rural Infrastructure
ESA	Economic Stabilization Act
FACU	Federal Agriculture Coordinating Unit
FAO	Food and Agriculture Organization
FEM	Foreign Exchange Market
FOS	Federal Office of Statistics
IMF	International Monetary Fund
KCAL	Kilocalorie
NACB	Nigerian Institute of Social and Economic Research
NDE	National Directorate of Employment
NISER	Nigerian Institute of Social and Economic Research
PSE	Producer Subsidy Equivalent
RBDA	River Basin Development Authority
SAP	Structural Adjustment Program
SFEM	Second-tier Foreign Exchange Market
TCPC	Technical Committee on Privatization and Commercialization
USDA	United States Department of Agriculture
WHO	World Health Organization

*U.S. G.P.O.:1992-311-326:60293/ERS

UNITED STATES DEPARTMENT OF AGRICULTURE
ECONOMIC RESEARCH SERVICE
WASHINGTON, DC 20005-4788